

Railway Age

Vol. 80 February 20, 1926 No. 8

An International Sleeping Car Train in Siberia—Photo from Ewing Galloway

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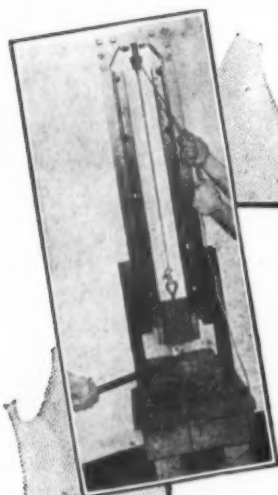
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PORCELAIN INSULATORS. LINE MATERIALS. RAIL BONDS. CAR EQUIPMENT. MINING MATERIALS. VALVES.

Railway Age

Vol. 80, No. 8

February 20, 1926

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Page 5 of Advertising Section

History Is Repeating Itself

THE reports of tie production in the principal producing areas of the United States, presented at the recent meeting of the National Association of Railroad Tie Producers at Cleveland and abstracted in the *Railway Age* of February 6, indicate an abnormally low rate of production prevailing in most areas. This is due in part to the influence of good crops last year in the hewn tie regions and in part to adverse weather conditions. It is a result primarily, however, of lack of demand on the part of the railroads. The extent to which this falling off in demand is the result of increased production along the right-of-way reduces the cause for concern. Most of the reduction in demand is the result, however, of decreases in stocks on hand and postponements of purchases. The inevitable result of this condition will be the realization in the near future by numerous roads that they must enter the market quickly for their requirements. Each road will then endeavor to protect itself and they will begin bidding against each other, forcing up prices and at the same time lowering their inspection requirements and accepting poorer ties. This condition, which recurs at fairly frequent intervals, imposes an entirely unnecessary tax on the roads. Their tie requirements are fairly uniform from year to year. It is therefore possible for them to anticipate their demands fairly accurately and place their orders accordingly. This is not done, however, and as a result the roads pay unnecessarily high prices for their ties and also secure poorer material. The roads are now facing a period of higher prices for ties, for production has been discouraged for several months by lack of demand. When demand develops, it will take several months for production to be brought up to normal.

Worthless Inventions

NEARLY all railway tracks throughout the world conform to a design that was developed many years ago. Even English railway tracks equipped with the bull-head rail embrace no marked deviation from the basic idea. Yet thousands of inventors have striven for years and are still striving to perfect radical changes in the character of the rails, ties, joints and fastenings. Judging from the patent papers which reach the desks of the editors of the *Railway Age* most of the inventors of these alleged improvements in track appliances are totally lacking in the elements necessary to success in their projects. They have no practical knowledge of track construction and maintenance or of the mechanics of the track. They are without an understanding of the requirements and limitations of practical manufacturing processes. They do not appreciate the problems imposed by any radical departure from present practice and have no conception of the difficulties attending the promotion of a new device. They are, therefore, doomed to failure from the start. Their time is wasted and their money is dissipated in patent expenses and in efforts to market the invention.

Obviously, the United States Patent Office cannot provide what might be termed a "bureau of discouragement" and patent attorneys who could perhaps perform this function, have not been particularly successful in this direction. This means that in most cases the idea has been patented before it is brought to the attention of railway men and however much they should foster inventions in the interests of the railroads, it devolves upon them to deal with frankness with the misguided individual who is staking his competence on some worthless invention.

The Usefulness of a Telegraph Censor

BREVITY in the wording of telegrams is a virtue, regardless of the value of the time saved on the wires, for most of us find that a careful cutting out of superfluous words becomes a profitable process in self-education. The art of succinct and forceful expression is one which will bear indefinite cultivation. The order of the president of the Kansas City Southern, calling for improvement in the wording of messages for the sake of economy in the telegraph department (noticed in another column), is to be commended—and should be imitated. The enforcement of such an order is, of course, a continuous task. After a pleasing degree of improvement has been accomplished we are liable to relax, forgetting that relaxation is one of the universal human weaknesses. Neglect of brevity—for brevity sometimes means a rewriting and a few minutes study—is often easy to fall into, under the influence of a feeling—perhaps a knowledge—that the wires are not over-busy and the operators not over-worked; why spend time and brain power on a saving that does not save anything? We inwardly remonstrate, as loudly as does the consignee of freight who has to pay demurrage when he knows that the railroad has empty cars rusting on storage tracks. But, the only businesslike rule is to adhere to the standards at all times.

Something to Build Upon

ALMOST any man will be willing to state in public that he is a believer in such abstract principles as justice and a square deal. It is in the application of these principles to concrete cases where differences of opinion arise. Thus it happens that statements of high principles and noble resolve tend to carry much greater weight with people when they are spoken in connection with concrete proposals, rather than when issued merely as polite discourse. All of which leads us to the belief that the testimony of railroad executives and representatives of employees before the Senate committee on interstate commerce in behalf of the new labor bill affords a solid foundation on which happier human relations in the railroads may be built. Every man in railroad service should read that testimony. It goes far toward showing the real spirit of the railroads, as contrasted with the fantastic villainy portrayed, and believed by some, in the past. All

this transcends the actual merits or demerits of the bill, which have been discussed previously in these columns. The point is that the accord which was reached and given expression before the Senate committee should be brought to the attention of every man in railroad work—with the hope and promise which it brings for more satisfactory human relationships all around.

A Measure of Operating Efficiency

THE real significance of gross ton-miles per-train-hour figures as an index of operating efficiency was pointed out in a striking manner in Professor Cunningham's address before the January meeting of the New England Railroad Club, reported on page 373 of the February 6 issue of the *Railway Age*. Both load and time factors are included in this figure which is affected favorably or otherwise by the efforts of so many different classes of employees that it affords one of the best measures of railway operating efficiency available. Too little attention has been given to this index in the past, except possibly by those railway operating officers who recognize that it reflects the efforts of train crews, dispatchers, operators, yardmasters and others having to do with train service. As a matter of fact, it also reflects the efforts of employees in the mechanical and engineering departments. The condition of the railroad machine, including cars, locomotives and roadbed, has a direct and vital influence on gross ton-miles-per-train-hour figures. In the case of the road mentioned in Professor Cunningham's paper, the provision of new facilities such as additional sidings, rearrangement of yard tracks, new power and enginehouse improvements, accompanied by a special campaign to enlist the sympathy and co-operation of the employees, resulted in an increase of 32.5 per cent in gross ton-miles-per-train-hour performance within a period of 12 months. This was accompanied by a decrease of 25.7 per cent in fuel consumed by freight locomotives and an increase of 30.5 per cent in car-miles-per-car-day. Locomotive repairs per thousand gross ton-miles decreased 28.7 per cent and enginehouse expenses 44.8 per cent on the same basis. It is evident that all departments of a railroad can well afford to watch the gross ton-miles-per-train-hour output.

Mixing Steel and Wooden Cars

MIXING steel and wooden cars in a passenger train is generally considered as bad practice and detrimental to the safety of the traveling public. Nevertheless, there are instances where this practice is still being carried on in this country. Some roads place the wooden cars at the front end of the train and the steel cars at the rear; others reverse the arrangement, while still others mix the wooden and steel cars indiscriminately. When a front or rear end collision occurs, according to the fundamental laws of mechanics the shock of the impact must be absorbed, and the weak point, by failing, protects the stronger points. Thus, in the case of a mixed passenger train, the wooden cars absorb the major portion of the forces set-up by the collision by their whole or partial destruction, depending on the severity of the impact. The results to the passengers in these cars are obvious. This does not mean that passengers riding on a train consisting entirely of all-steel cars are completely protected against loss of life or injury. Many serious collisions have occurred to all-steel equipment in which steel cars have been completely telescoped with a serious toll of life and limb. But under these circumstances public opinion

cannot be directed against the railroads for not taking all necessary precautions, as far as the consist of the trains are concerned, to fully protect the passengers. On the other hand when a collision or derailment occurs in which mixed wooden and steel cars are involved, the railroad stands convicted in the public mind of a much greater offense than the facts may warrant. A single accident involving such circumstances, no matter how little blame may be attached to the railroad so far as its primary cause is concerned, may cost the road not only such reputation for safety as it may have been able to build up, but more good will on the part of its patrons than can be restored through years of assiduous cultivation.

A Railway Return Many Years Overdue

THE net operating income earned by the railways in 1925, although the largest in amount in their history, is almost exactly what they should have earned, to comply with the provisions of the Transportation Act, in the year in which the act was passed six years ago. In other words it has taken six years, the investment of approximately four billions of new money, and unremitting efforts to reduce operating expenses, to produce in 1925 a fair return on the capital invested in the railways in 1920. The additional investment has therefore as yet received no return, while forces of considerable strength are continually at work to further reduce rates and increase wages. The fair return for the first two years of the operation of the law was fixed at 6 per cent. The Interstate Commerce Commission in the 1920 rate case placed a tentative valuation on the railways of \$18,900,000,000 as of December 31, 1919. Six per cent on that would have been \$1,134,000,000 a year and the commission advanced rates to a point which it was hoped would produce approximately that amount. The rates, however, could not be made effective until the latter part of 1920 and the next year there was a business depression. In 1922 the commission reduced rates and also reduced the fair return percentage to 5¾, a figure which has not yet been attained by the railways as a whole. By a curious coincidence the net railway operating income for 1925, \$1,136,984,243 for the Class I railways, closely approximates what was officially proclaimed to be a fair return for 1920. The commission has not yet taken occasion to promulgate a new tentative valuation, but the property investment account of the railways has increased from \$19,514,000,000 at the end of 1919 to approximately \$23,500,000,000 in 1925, so that the net for 1925 represents a return of only 4.83 per cent, or less than the percentage on investment earned in either 1916 or 1917. It also happens that the total operating revenue of the railways in 1925, \$6,186,000,000, was almost the same as that of 1920, \$6,178,000,000. Operating expenses, however, have been reduced during that time from \$5,827,000,000 to \$4,583,000,000, or by \$1,244,000,000, so that the entire net railway operating income of 1925 is less than the savings accomplished by reductions in operating expenses. All this affords an excellent illustration of the way that the performance expected to result from legislative and regulative policies as applied to economic conditions so often fails to keep pace with the development of practical conditions, and it is especially interesting when considered in connection with the assertion so often made by unfriendly or uninformed critics of the railways in the past, and occasionally repeated even now, that the railways were guaranteed a fair return by law.

An Achievement in Stabilizing Employment

ALTHOUGH the railroads as a whole have as yet been unable to find a way of taking concerted action in stabilizing employment, there is no question but that distinct progress has been made in this direction in many ways during the past few years. This has been actuated by humanitarian motives, as well as by the fact that it is becoming generally recognized that labor turnover is costly from both the standpoints of breaking in and training new workers and the loss of morale due to the fluctuation of forces.

A striking instance of real accomplishment in stabilizing employment is the record of the Delaware & Hudson during the strike in the anthracite field. L. F. Loree, president of that road, impressed with the importance of stabilizing employment, has devised what has been designated as an elastic working day. In his own words, "The spread between an eight-hour and a ten-hour day is 25 per cent going up and 20 per cent coming down. If you look over the experience of the railroads of this country for the last quarter of a century you will find that there has been only one year when the traffic increased more than 25 per cent; there has been only one year when it decreased more than 20 per cent. So it is manifest that if we can have a flexible day, floating between eight hours on the one hand and ten on the other, we can protect the employees against the fluctuations of business.

As a matter of fact, our company, since the first day of July, 1922, has not found it necessary to discharge any man on account of lack of employment. There has never been a time in that period when we weren't working different groups of men different hours—most of them eight hours, but some of them as many as eleven—and they are happy and contented and feel that they have a real stake in the situation."

President Loree's thought is that the eight-hour day as a practical minimum under ordinary circumstances, will insure the worker sufficient compensation to provide a good standard of living, and that the nine or ten-hour day, which will be effective for only a part of the year, will not be at all injurious; moreover, the added compensation will be greatly appreciated by the average worker.

While the business of the railroads as a whole may fluctuate within the limits indicated by Mr. Loree, there are occasions when an individual railroad may have much wider fluctuations. This was true in the case of the Delaware & Hudson during the 170-day strike in the anthracite field. Apparently, however, the Delaware & Hudson management felt so strongly about the value of stabilized employment that it not only kept its forces intact, but the shops at the close of the strike were still working on a 40-hour week. It was, of course, impossible to protect the train and enginemen in the same way, because with the let-down in business, fewer trains were necessary. It took real nerve to maintain this heavy drain on the treasury. Not only was the equipment brought into an excellent state of repair, but some of it was rebuilt to provide work for the men. The test was an exceedingly severe one.

Do the employees realize what it has meant to carry on in this way? What will be the effect upon their morale and efficiency? Only the future can tell. Let us hope that it will fully justify the confidence which the management has had in the importance and practical value of stabilized employment.

Swaying Cars and Low Joints

T. H. SYMINGTON, in the *Railway Age* of January 16, page 234, presented a discussion of the excessive swaying of large hopper cars having a high center of gravity and outlined a number of suggested improvements in car design to overcome this potential cause of derailments. This same subject has been approached from an entirely different angle by B. R. Leffler, engineer of bridges, New York Central, in a monograph appearing in Bulletin No. 279 of the American Railway Engineering Association, in which he developed the mathematics of the compound pendulum as applied to a swaying car. Mr. Leffler's discussion is directed primarily towards the influence of staggered rail joints on the amplification of the swaying under favorable conditions. The amplitude of the sway of a car increases if a periodic impulse or push is applied in the proper direction in synchronism with the period of vibration. Such a periodic impulse can be provided by the staggered joints in the track if the speed of the train is such that the trucks pass over a joint at an interval of time equal to that required for the completion of a complete cycle of the sway of the car. This condition has been subject to practical demonstration in that it has been found that cars of the same type, when under substantially equal load, sway much more at a particular rate of speed than at any other speed. The condition is also aggravated when the distance between truck centers is substantially equal to the length of the rail so that the wheels of both trucks will strike a joint at about the same time.

Mr. Leffler's studies have led him to suggest an ingenious method of breaking up this periodic impulse of rail joints on the swaying of cars by alternating 33-ft. and 39-ft. rails in the same track. Officers in charge of track will, of course, point to many objections to this practice, primary among which is the fact that it will at once eliminate one-half of the economies to be effected by the use of the 39-ft. rail. This objection might perhaps be overcome by alternating 45-ft. rails with 33-ft. rails, an arrangement which would introduce an irregular spacing of joints but with no more joints per mile than in track laid exclusively with 39-ft. rail. Unquestionably the majority of officers in charge of roadway will contend, as does Mr. Symington, that the cure lies in the proper design of the car. However, Mr. Leffler has rendered a real service in offering a rigid mathematical demonstration of the physics of swaying cars.

Is Pitting a Serious Problem?

A TROUBLE or difficulty may appear large in our estimation mainly by reason of comparison with other problems. Thus, as one problem is solved another appears more serious, whereas it may in fact have remained unchanged. This is largely the case with boiler pitting. It has long been a problem for those engaged in the maintenance of locomotive boilers and for those concerned in providing for these boilers water of minimum objectionable characteristics.

Pitting has been known to railway men for a half century or more. It has recently assumed a new importance in the eyes of some railway men, however, as other water troubles have been eliminated or reduced by the selection of less objectionable supplies or by the elimination of some of the injurious effects by treatment.

Taking the country as a whole, there has been a vast improvement in the quality of the water furnished loco-

motives in the last quarter of a century. This has been particularly pronounced as to scale removal, but scarcely less evident with reference to the prevention of foaming. As a result of the improvements in these respects and the decreased trouble resulting therefrom, pitting has come to assume a new importance in the minds of some railway officers, although it is largely the same pitting that has long existed but was formerly overshadowed by more serious troubles. By this we do not desire to be understood as minimizing the serious character of pitting but rather of attempting to prevent its importance from being unduly exaggerated.

Furthermore, as the article entitled, "Pitting—a Myth or a Menace," which appears on the following pages of this issue, indicates, pitting is not the baffling problem it once was, for while it has not been eliminated entirely, marked progress has been made in checking its inroads. In fact, on some roads pitting has been reduced to the point where its further curtailment under present conditions will cost more than the damage it creates. In other words, its reduction has reached a point of economic equilibrium.

In view of the concentrated constructive study given to this subject in recent years and still being given it by technical and scientific organizations such as the American Railway Engineering Association, the Mechanical section of the American Railway Association and other organizations outside the railway field, it is to be expected that further discoveries will be made that will enable pitting to be still more closely controlled and the economic limit still further reduced. Therefore, while pitting still constitutes a tax of no small consequence on locomotive maintenance expenditures, it is not the problem that it was a few years ago on those roads which have given the subject detailed consideration. The article on the following pages, to which reference has already been made, constitutes a review of this subject which warrants careful consideration.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Consolidation of Railroads 1925. Second supplement to list of references, the original list having included material published from 1919 to 1923, and the first supplement material from 1923 to January, 1925. 21 p. Issued by Library, Bureau of Railway Economics, Washington, D. C. Apply.

Independent Offices Appropriation Bill, 1927. Hearings before sub-committee of the Committee on Appropriations, House of Representatives, January-February, 1926. Work and needs of Interstate Commerce Commission, p. 632-693; of Railroad Labor Board, p. 265-275. 731 p. Published by Government Printing Office, Washington, D. C. Apply to Comm.

The Railways 1825-1925, by J. T. Walton Newbold. A concise history of railway expansion over the world presented from a somewhat unusual point of view. 112 p. Published by Labour Publishing Company, Ltd., London, England. 4s. 6d.

Report [on number and nature of reports now required by the Interstate Commerce Commission, and number and nature of reports required by various utilities commissions of the separate states, on expense of making these reports, and number which in judgment of commission can be dispensed with], by United States Interstate Commerce Com-

mission. Submitted to Senate February 12, 1926. 49 p. Issued by United States Interstate Commerce Commission, Washington, D. C.

Turn South, by Mississippi-Warrior Service. Traffic, operation, and facilities of Federal Barge Line. 30 p. Published by Mississippi-Warrior Service, New Orleans, La.

Railway Mileage of the World, 1922 and 1923, compiled by Bureau of Railway Economics. Mileage, area, population in individual countries from latest generally available statistics. 2 p. Pub. by Bur. of Ry. Econ., Washington, D. C. Apply.

Some L. N. E. R. Posters. Reproduction in miniature of 19 posters issued by this railway. Pub. by London and North Eastern Ry. Co., London, Eng. Available in this country from U. S. Agent, L. N. E. Ry., New York City. Apply.

Periodical Articles

Railroad Growth in 25 Years, charted and described by Richard Waterman. Facilities and equipment, freight and passenger traffic, employees, and revenues and expenses charted, 1900-1925. *Nation's Business*, February, 1926, p. 41.

The Second South American Transcontinental Route. Map and text on the two Trans-Andean railroad routes now used for traffic. *Bulletin of the Pan-American Union*, February, 1926, p. 162.

The Cincinnati & Green River Railway Company, by Edgar B. Wesley. Register of the Kentucky Historical Society, Jan., 1926, p. 59-63.

Industrial Pensions for Old Age and Disability, by Mary Conyngton. Analyses terms, advantages and disadvantages, substitutes proposed, etc., of pension systems of 16 banks, insurance and financial houses, 27 railroads, 15 street railroads, 2 telegraph and telephone companies, 15 other public utility companies and 61 industrial concerns. *Monthly Labor Review*, January, 1926, p. 21-56.

The Motor Bus Situation in 1925, by Murray W. Latimer. History and prospects. *Harvard Business Review*, January, 1926, p. 153-170.

Some Business Aspects of "Adequate Transportation Service," by Dr. Carson S. Duncan. What operating efficiency means to business shown by definite examples. *Harvard Business Review*, January, 1926, p. 145-152.

Railroad Consolidation—England's Railroad Muddle, by Edward Hungerford, and *Consolidation—or Public Ownership,* by Albert B. Cummins. Results of consolidation in England, and reasons for consolidation here. *Nation's Business*, Feb., 1926, p. 13-17.

New Books

What the Coal Commission Found; by the Staff of the United States Coal Commission. 416 pages, 5½ in. x 8 in. Bound in cloth. Published by Williams & Wilkins, Baltimore, Md.

No railroad man needs to be told of the importance of the coal business to the railroads. And everybody knows that just now everything is not well in the industry. The anthracite miners were recently on strike and the bituminous industry as a whole is far from living on the fat of the land—except in places. There are too many mines and too many coal miners. From a national point of view, the coal industry offers one of our most perplexing problems. Congress has before it recommendations for legislation on the subject. That being the case, the discussion contained in this book of the whole problem with recommendations by the commission appointed by President Harding in 1922 makes timely reading.

Letters to the Editor

[The RAILWAY AGE welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

"Derivations from an Economic Sentimentalism"

NEW YORK.

TO THE EDITOR:

Mr. Eaton's article on the Potter plan, in your issue of February 6, merits correction in several particulars, notably its false analogy between the pools of 1870-1887 and Mr. Potter's proposal and its misleading characterizations of those early pools. He asserts that their:

"Underlying principle was the regulation of each road's individual operations by consideration of the needs of the group as a whole."

He also declares that each carrier in these pools surrendered something:

"In order to assure a general stability in which it shared."

If these statements are more than mere juggling with certain cant phrases of recent origin, they are plainly *ex post facto* derivations from an economic-sentimentalism that would have been as repugnant as strange to the strong men who were the railway leaders of the pre-regulation period. They could have weight with those only whose conception of the history and industrial philosophy of the two decades that immediately antedated the Cullom law are superficial and devoid of illumination.

The concessions that were made to the old pools were the price paid for peace, tribute reluctantly admitted in recognition of circumstances that made the cost of potential conflict seem even greater. They were the lesser evil, chosen because the alternative, impairment of earnings by the excessive competition that the pool suppressed, was deemed even less desirable. The railway that surrendered part of its traffic or earnings did so to procure immunity from destructive competition that it believed would entail greater sacrifice. In participating in these pools no railway ever sought anything or expected anything except its own corporate advantage—the railway that had the traffic, to lose less than it would lose from unbridled competition; the railway that did not have it, to gain more in what it received out of the pool than it could by contest. Current discussion ought not to be befuddled by attributing to history implications that it cannot sustain.

No railway manager of 1870 to 1887 would have tolerated for a moment the notion that he had either the legal or moral right to take from his own stockholders in order to contribute to the well being of some other corporation. He would have regarded such action in its true light, as plain and unmitigated theft and would not have needed to consult his counsel to understand that he would be personally liable for every dollar so illegitimately diverted.

The writer is convinced that the managements today are not less appreciative of the legal and moral inhibitions that prevent acceptance of the Potter plan. At least no advocacy of that plan on the part of any officer who would

pay into such a pool more than he would take out of it has been heard. And, to their everlasting credit, substantially all those who would be the beneficiaries of that plan, if it were now in force, have declined to participate in its advocacy. Of course the idea of expanding earnings by means of contributions rather than the expenditure of capable effort in the contrivance of economies cannot fail to have attractiveness in some quarters. And is it not worth noting, *en passant*, that the Chicago, Milwaukee & St. Paul was built from Marion Junction to Council Bluffs, in the early 80's, for no other reason than that the existence of the Chicago-Omaha pool warranted confidence that a share in the traffic could be obtained, as it was actually obtained by concession from the pool, because the lines already existing, amply sufficient for the traffic available, would submit to some sacrifice rather than accept the greater burden of conflict.

There is, of course, no similarity whatever between the old pools and the Potter plan. The old pools related to competitive traffic and had the single purpose of mitigating competition. Mr. Potter would pool the receipts of the Bangor & Aroostook with those of the Atlanta, Birmingham & Atlantic, an arrangement clearly *ultra vires* as to either corporation and would render the directors of the former individually liable for anything they paid out in accordance with the unwarranted contract.

H. T. NEWCOMB,
General Solicitor, Delaware & Hudson.

A Further Discussion of Transverse Fissures

CHICAGO.

TO THE EDITOR:

I cannot refrain from comment on the editorial concerning transverse fissured rails in your issue of December 5, and the remarkable letter from Director Borland of the Bureau of Safety in the issue of December 26. The quality of steel rail in resistance to failure has for many years occupied, and will continue to engross most of my personal attention. As one of the metallurgists primarily in railway service, I think that both mill and track must join in pleading guilty to your indictment of not having settled the transverse fissure problem, and throw ourselves on the mercy of the court of engineering opinion. We should, however, be granted a suspended sentence, provided speedy productive scientific activity characterizes our course.

If steel rail as a class is really being overworked, Mr. Borland's pessimistic state of mind would seem justified, and all those responsible for its metallurgical condition would share in his distress, especially as the harder and stronger rails, not only according to chemical composition but also in physical compactness and homogeneity of structure, appear to display in a small percentage of their total production lessened resistance to storing up cooling and cold rolling strains. We must admit that it is hardly now possible to make rails as a class more resistant to these cumulative strains without encountering worse difficulties in many other directions. The issue, therefore, is whether or not rail in general is being overworked.

I happen to be familiar with the rather complete track record of nearly 16,000 rails broken from simple transverse fissures over the last 12 years, and reasonably familiar with the manufacturing data on a considerable portion of them. Without intending to primarily discuss these data, as they will be submitted within a short time

to an official co-operative investigating body, Mr. Borland's estimates in his letter are in general correct. Of the 50,000,000 rails whose useful life would have otherwise been unattended by serious disaster, 16,000 failed through this particular defect. Without endeavoring to mitigate the seriousness of our present situation, perhaps less than 100 of these breaks have been attended by any injury to life or limb, and relatively few of the remainder by derailments causing property damage. One cannot admit Mr. Borland's view that a proportionate number of the rails now in track may be expected to fail with equal menace, as the data indicate a considerable reduction of the failure rate in the East since certain rollings from certain mills rolled from 10 to 15 years ago have been worked out of track. Doubtless there will be, in the West, an increasing number of fissure failures for a few years to come. This is due to their now reaching only the equivalent amount of service, from rollings in these same periods, as was accumulated on the Eastern roads in a much shorter time. The relative traffic densities account entirely for the situation, inasmuch as no one can quarrel with Mr. Borland's diction in stating that the *development* of transverse fissures is quite entirely a function of the number and loaded weight of wheels passing over rails which have the nucleus of failure. Metallurgists of the railways believe the nucleus in rails to be pre-existent to track service, and that without its presence our heaviest loads and traffic densities have never to our knowledge developed a detail transverse fatigue failure whose origin is in the zone stressed both by cooling and service.

One of the surest indications that the weight of the load itself or the speed has but little to do with it, is that Western conditions of lighter loads and relatively lower speeds are developing transverse fissure failures from the same old kind of nuclei, but are taking over twice the number of repetitions of lighter loaded wheels to develop them to ultimate failure.

Mr. Borland states that all of the 50,000,000 or more rails in service were subjected to cooling strains in no respect different from the few which have displayed transverse fissures. It would seem that he rather curiously mistakes cause for effect. One might agree that the stresses set up in the more or less yielding hot metal through cooling are in general of the same order of magnitude for any one section, but the strains remaining in the rail head after leaving the hot beds are not only functions of the stresses but are more specifically functions of the ability of the particular heat in plastic yielding. That differences exist from heat to heat in this respect is unquestionable, whether the metal goes into rails or side frames, and these differences are independent of the rate of cooling, except that the more rapid the cooling, the more apt cracks are to develop. If cooling is gentle, the strains persist without the crack.

These variations in hot ductility, plasticity, or whatever one may choose to call it, may or may not be intimately related with gas inclusion, but many investigative laboratories, in working on such defects as snowflakes in gun and other alloy steels, have very clearly proven the variations quantitatively as of considerable magnitude.

While Mr. Borland states that the nucleus is "nothing," therefore a void, this line of reasoning should therefore be extended to calling a crack a void and therefore nothing.

If a crack is a result of a manufacturing condition, Mr. Borland believes that, being nothing, it should not be called a defect. He defines a defect as something which must be known as a definite entity. This seems to be a quibble when applied to a shrinkage crack, concerning which a distinguished engineer-physicist has stated "Any

one of which would seem might be the starting point of a transverse fissure, among those properly oriented."

An extremely important justification for hope lies in the efforts of a distinguished scientist who has gone far in developing a track recording device by which growing transverse fissure discontinuities within the rail head may be detected. Unfortunately neither it nor any device known to science in its present state can hope to reveal the presence of such small discontinuities as the nucleus or shattering crack during inspection, either by the mill's own organization or those serving the railways in this capacity.

Some of us have pretty well defined leads as to their probable cause. An investigation is now proceeding, sponsored, at railway initiative, by the Department of Commerce. Facts, not theories, as to the history in mill and track of all known transverse fissured rails and heats, will point the way toward utilizing the facilities of the laboratory of the Bureau of Standards, as well as the laboratories of both railways and rail mills. This will go far in my judgment toward permanently settling the issue and providing adequate remedy.

JOHN B. EMERSON,
Vice-President, R. H. Laverie & Sons, Inc.

The Golden Rule on the Railroads

NEW YORK.

TO THE EDITOR:

It is heartening to see the evidences now and then appearing in the columns of the *Railway Age*, recognizing the practical relation of religion to business. Religion is of no value unless it is useful to the everyday man in everyday business and we shall do well to give it increasing attention. I refer not alone to your reports of gatherings under the auspices of the Railroad Young Men's Christian Association, but also to certain notices of a more pronounced ethical character. For example, C. E. Johnston, vice-president of the Kansas City Southern, is quoted in your issue of February 13, page 447, as declaring that *the Golden Rule is still workable*.

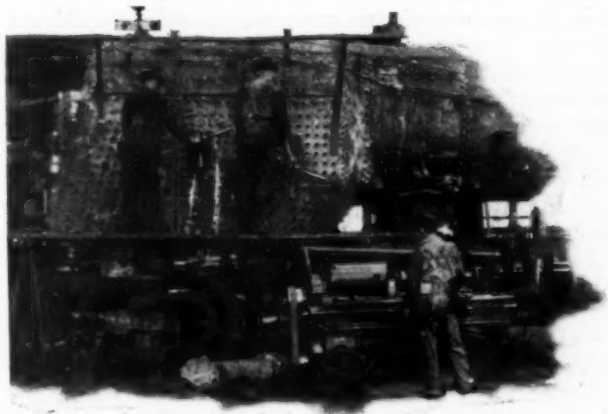
This, in an official document, as quoted, is nearly equivalent to an order to employees directing them to engage in the practice of exemplifying that rule. There is nothing unreasonable in this. All of the varied circulars and lectures, issued by railroads exhorting their employees to do their duty to passengers in every instance, and especially to passengers who are in trouble or in any degree anxious, are only different manifestations of the same idea.

Mr. Johnston's circulars are quite unusual, in this and in other particulars; but he is not the only railroad officer who aims to exalt Christian ethics. The superintendent of a division on one of the biggest trunk lines, recently observed that the Golden Rule was the *only* rule that could be depended upon to insure right relations in the disciplining of men in the train service; "right relations" meaning scrupulous fairness, and even generosity, toward every employee, coupled with the unvarying requirement that the employee shall give high-grade service. President Coolidge has said, in substance, that religion is the only hope of the country.

The Golden Rule is to be found in the New Testament; and, as was said recently by Sir Henry W. Thornton, president of the Canadian National, the New Testament is a very good book for railroad men to read.

W. S.

Pitting—A Myth or a Menace?



Detailed survey reveals progress being made in eliminating corrosion of boiler steel

By D. A. Steel

IT is not known whether pitting was encountered in the locomotives whose introduction signalled the birth of steam transportation in this country, but it is probable from the present knowledge of the causes that it was discovered shortly after rails were laid west of the Allegheny mountains. While the tendency of early investigators not to draw fine distinctions between the several boiler troubles attributed to water noticeably limited the instances where corrosion is referred to specifically in their discussions, it is certain that pitting and grooving were known in the '60s and became an increasing source of trouble with railway expansion.

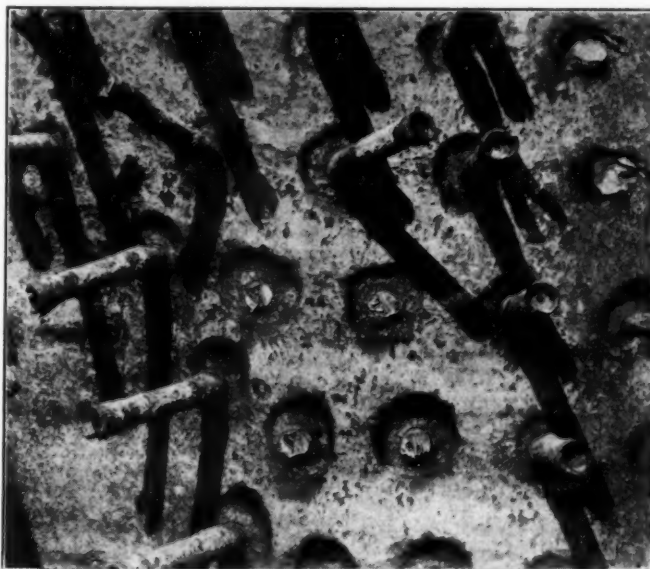
Pitting Is Not a New Trouble

The old American Railway Master Mechanics' Association was organized in 1867. During the following year, in the first technical report of any kind ever presented to that association (a report on boiler explosions), the committee said: "A singular phenomenon presents itself. Recesses are found varying in size from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. in diameter and extending nearly through the sheet, singly and sometimes in groups. These are generally found on the bottom and lower sides of the boiler shells in places covered with sediment." This was 56 years ago, only two years after the first rail was laid west of the Mississippi river. Three years later, in a symposium before the same association on the experiences of railroads with impure water (of which there was plenty, from indications) we find, for example, the Lake Shore & Michigan Southern reporting that "in some sections impurities destroy the bottom of the boiler after three years' service"; also the statement of the Western Pennsylvania Division Railway that "on removing scale from tubes that have been running less than three years places are found where the iron has been entirely eaten through, varying from a needle point to $\frac{1}{4}$ in. along the entire length of the flue." It was only two years after this, 54 years ago, when another committee of that association observed that "in some sections of the country the water is impregnated with lime and minerals that attack the iron along seams around rivet and bolt holes and wherever the grain of the iron has been disturbed in the process of manufacture, frequently making it necessary to renew portions of the boiler in two or three years and flues in a year or eighteen months." This committee also reported a case where a boiler "was pitted all over although the scale on the flues seemed to be hugging perfectly tight with not a spot but what was covered." Thus is it evident from reports of one convention after another not only that pitting is not new to the

railways of this country, but that it has received the attention of railway men from the time of things which in the progress of transportation are now merely historical.

Millions in Pitting Elimination

Within the last few weeks, however, the mechanical department head of one of the largest railroads of the country publicly declared that one of the pressing needs of the present is a solution of the problem of pitting and corrosion. Several months before, in a letter to this publication, an executive of an equally large road wrote that the eradication of pitting would save the railroads millions of dollars. The inferences from these expressions are



A Close View of Firebox Pitting Which Also Extends to Staybolts

that pitting and corrosion have not been eliminated. The fact is that a great deal of pitting is to be found. The prevalent opinion, indeed, is that pitting is on the increase. Under these circumstances it is not surprising that some disquietude should be felt, especially in the light of showings that some roads can save \$100,000 a year, as a conservative estimate, through the extermination of this difficulty. It is appropriate, therefore, that something should be done.

It would be a mistake, however, to conclude from the

knowledge of flourishing cases of pitting that nothing has been accomplished towards its eradication or to find cause for undue alarm in the amount of it. Unfortunately, such conceptions are current. The one presupposes that the past has proved a failure, the other that boiler conditions were never worse. Both are as inimical to progress in pitting control as they are unsound. They are scarcely less in need of correction than the attitude toward the pitting problem that was expressed recently by a railway office of position that if there were not pitting to bother there would be something else in its place.

Conditions Are Misunderstood

The fact is that in many instances pitting is not as bad as it is thought to be. It was only recently that an executive officer found to his surprise, but equally to his pleasure, that the pitting on his road was confined to a relatively small area instead of to the entire property as he had come to believe from the reports reaching his attention. The probabilities are that the water inspector has not been hired who cannot recall instances of alarm surrounding reported troubles which were found to be uncalled for by the actual facts. In the recollection of these facts and the ease with which officers who, not being immediately or continuously in touch with pitting disturbances, can acquire distorted impressions of conditions, it may well be repeated that there are many instances where pitting is not as bad as it is thought to be, a fact which plainly enough emphasizes the importance of investigating conditions before steps are taken to correct them.

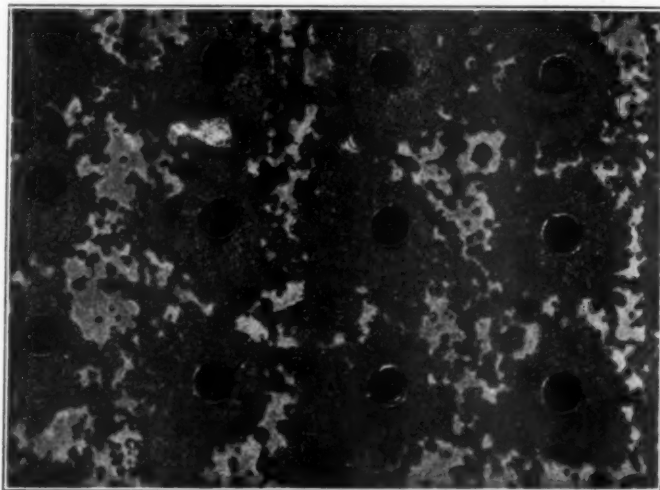
Again it is found that in many instances pitting is no more prevalent now than before, but only appears so in contrast with the periods when more aggravated boiler troubles kept it in the background. Pitting and grooving are peculiar to regions of bad water. Actually they are properly attributed to bad water insofar as a favorably disposed water is essential to the process. But pitting is only one of many boiler troubles that have at least been peculiar to regions of poor feed water. Generally it has caused the least expense and aggravation. Certainly this is true in sections of especially bad water. The other troubles are those from incrustation and foaming. Failure of locomotives to steam, clogged feed pipes and injectors, stuck boiler checks, collapsed tubes, burned sheets, leaking, dry cylinders and empty water glasses are among their effects. These troubles are experienced today but in nowise compare with their intensity in the past.

A few illustrations will prove useful in this connection. Back in 1871, reverting again to the proceedings of the American Railway Master Mechanics' Association, the Hannibal & St. Joseph reported the practice of "taking out part of its flues at the end of six months and all of them at the end of the year to remove the sediment and soft scale." During the same year the Illinois Central cited the practice of "taking out flues every four months to remove the scale or when the engine had run from 8,000 to 10,000 miles," a road whose passenger engines now run an average of 120,000 miles between shoppings and freight engines 80,000 miles before flue removals, while frequently these flues comprise only the usual section necessary to boiler inspection.

There are many roads where trouble was far more aggravated than on the Illinois Central. Thus the Atchison, Topeka & Santa Fe which, according to a report made before the American Railway Engineering Association in 1905, had 456 engine failures just from leaking in 1902 as compared with only 55 in 1904 after the inauguration of water improvement work, while the average service of its flues between renewals was only from six to eight months, as a result of conditions which are de-

scribed by a former superintendent of motive power of this road as a period when "it was a rare occurrence not to find an engine leaking." With the early and not exceptional troubles of this road may also be considered the Chicago & North Western which had 580 failures from leaking in 1902 as compared with 120 in 1904, in the face of increased tonnage following water improvements, and the Great Northern and the Missouri Pacific, where the calls for relief engines provided some of the most graphic pictures of a period when, as reported by the American Railway Master Mechanics' Association in 1871, "70 per cent of all boiler repair work in the west was caused by impure water" and when, according to reports of conditions made by mechanical officers since, the boiler work alone on some roads for periods even subsequent to 1900 was "double what it is now."

Under these conditions it is not surprising that pitting was only occasionally referred to specifically in early discussions. Pitting, given free reign, will occasionally kill an engine and may threaten explosions, but its tax is principally on the shop and storehouse, whereas scale usually brought the engines to the shop first and more often, and in addition caused operating troubles which



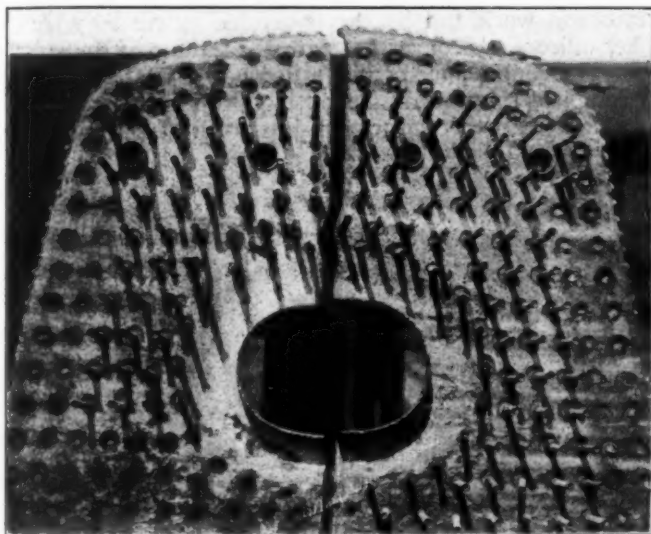
A Section of a Steel Plate After Drilling but Before Application, Which Illustrates How Corrosion Can Get its Start Outside of the Boiler—Note the Localized Character of the Rusted Areas, All of Which Are Centered Around the Holes

placed all other ills in a position of secondary importance. Hence many instances of pitting now are prominent not because there is more of it than before, except occasionally, where there may be more engines, but because, thanks to water conditioning work or other improvements, those troubles which commanded the first attention heretofore are less prominent now.

Much Pitting Has Been Eliminated

Indeed much of the corrosion which has troubled in the past has been entirely eliminated. It is not essential at this point to indicate how this happened, but it is proper to emphasize that such is the case. While the imperfect knowledge of the past concerning the relationship between pitting and incrustation, the usual prevalence of one where the other was found, and the primitive character of statistical compilations, etc., quite naturally discouraged any attempt at distinguishing between the precise nature of improvements in conditions as they were brought about, no close student of the subject can fail to recognize that corrosion was a contributing factor in much of the early troubles, and that this corrosion was among the disturb-

ances which, in many instances, have been suppressed. There is every reason to believe, for instance, that corrosion was involved in the trouble on the old Flint & Pere Marquette 55 years ago, when this road "sometimes found it necessary to renew its fireboxes in less than a year." But even with the general lack of differentiation as to the causes of improvements, conjecture is unnecessary. The Illinois Central specifically reports the reduction of corrosion as a contributing factor in securing the present mileage of its tubes; the El Paso & Southwestern furnishes a classic example of pitting eradication; the Southern Pacific re-



A Recent Case of Firebox Pitting—Note the Location and Extent of the Corrosion

ported cases of pitting elimination as long ago as 1899; the Missouri Pacific, prior to the disturbances of the shop strike, had witnessed the practical elimination of firebox pitting in 1919 and now finds that tube pitting per engine is much less than formerly, while striking instances of the suppression of pitting have been produced on the very road whose mechanical head has so recently urged the search of a cure for the evil. It is a well known fact, repeatedly recorded and illustrated in the columns of this publication, in the reports accepted by conventions of railway officers, and in papers before various technical societies that the last 20 years at least have seen boiler troubles removed from railway operation which if encountered at the present time in the intensity experienced heretofore, not only would constitute a serious drain on financial resources but would make many of the present locomotive and train performances impossible. Such being the case, it is highly important to a proper perspective of the pitting situation to know that in many instances corrosion was among those factors, the elimination or reduction of which affords the explanation for the disappearance of these troubles.

Pitting Has Increased in Some Treated Water Regions

It is true, however, that with all due consideration to the misapprehensions entertained concerning the status of boiler corrosion and the knowledge that much corrosion has been eliminated, there is pitting at the present time. It is the feeling in some quarters, moreover, that the situation is somewhat menacing from the fact that the pitting not only continues in many instances where water treatment has been attempted, but has increased in at least some of these territories. From the lines of the Chicago, Milwaukee & St. Paul, for instance, prominent for its contributions to recent literature on water conditioning

work, comes the statement that "we are experiencing 50 per cent more pitting today on our flues than we did years ago," while it is also significant that both roads mentioned at the outset of this discussion by reason of the comment of certain of their officers on pitting conditions are pioneers in water conditioning work. Although information from authentic sources to the effect that pitting is prevalent and generally more noticeable in regions of bad water which have not yet been subjected to water treatment, clearly discounts the idea entertained in some quarters that water treatment is necessarily the agent responsible for this increase, it does appear on good authority that water treatment—whether by removing protective scale or other action—has been a stimulant to it in some localities. However that may be, it is certain that there are instances where railroads are still getting only 12 to 15 months' life from tubes which, but for pitting and grooving, would give from 10 to 15 years' service (by successive safe ending) while fireboxes and boilers are being prematurely patched because of this trouble. In this connection, though with a note of caution, attention is directed to the following comparisons among the values of flues carried in stock on a few roads selected at random which differ in that two are favored with ideal water



Sections from Pitted Tubes

while the waters on the others are bad in places, but which are alike in efforts made during recent years to eliminate surplus stock.

Kind of Territory	Road	Typical flue stocks carried	
		Total value	Value per engine
Good water.....	A	\$12,382	\$34
	B	27,075	56
Bad water.....	C	\$297,424	\$155
	D	260,227	200
	E	372,699	195

The comparison of the average flue stock of \$45 per engine on the first roads with the average of \$180 per engine on the others is not rendered less significant by the knowledge that the bad water roads furnished engines with better water than was formerly the case.

In recognition of these facts and the further facts

(1) that material and labor costs are high, (2) that the requirements of power are increasingly exacting, (3) that the trend of natural waters, particularly surface waters, is certainly not toward improvement but in the more thickly populated sections noticeably toward becoming less acceptable for boiler use, and finally, in recognition of the increasingly less choice in the selection of supplies as a consequence of increased demands for water, particularly in those sections where the available supplies have been none too good or plentiful in the first place, it is quite obviously in the interests of economy and efficiency that the problem should receive attention. The force of this assertion is not lessened when it is recognized (1) that in all efforts toward increasing the efficiency of the present day locomotive the boiler is the principal point of weakness, (2) that except in the field of electrical transmission, the importance of eliminating pitting and its associated ills is emphasized rather than diminished in the case of those innovations in locomotive design now in prospect, among which is the turbine engine and (3) that success in the elimination of pitting will also reflect to the benefit of the railroads in the aid it will provide in the reduction of corrosion elsewhere, notably in connection with underground piping, heating plant conduit, etc., where corrosion is constantly making large and in some instances surprising demands on maintenance expenditures. The relationship between the origin of this waste and that in boilers gives the latter suggestion a large significance.

However, at this moment unmistakable progress is being made in the solution of existing and prospective pitting problems. Fifty-four years ago it was said of water troubles generally that "the subject has baffled the skill of the leading scientific and practical minds at home and abroad." That was a period of nostrums when all kinds of remedies were tried in an effort to overcome the troubles encountered. On the Santa Fe, for instance, a dozen or more methods of purification had been employed up to 1900, among which were petroleum oil, tallow, malt, starch, ship stuff, zinc and prairie soil. Potatoes, peas, wheat and moss were also among the remedies which various roads had tried. That was the period generally when the whole question of boiler ills was in somewhat of a jumble, when cures (giving due consideration to notable exceptions) were applied without rule or reason and the results left appreciably to chance. This situation has been radically changed for the better with reference to corrosion as well as to other boiler ills.

Interest of Managements Denotes Progress

The progress which has taken place in the solution of pitting reveals itself in various ways. When the problems of railway expansion, financing and traffic development were uppermost in the minds of executives and the economies of train and locomotive performance a consideration of less consequence than at present, the various boiler ills complained of were among those troubles which were almost entirely left to the inconvenienced parties to work out by themselves. The policy of managements was noticeably one of hands off. This is well illustrated in the following excerpt from the proceedings of the Master Mechanics' Association of 1872 "Master mechanics have had the conviction that impure water is the bane of good boilers but superintendents and presidents do not so readily see and appreciate its importance," after which may be added the representative statement made since that time by a superintendent of motive power that "The benefits of water softening are not so well understood by the higher-ups." This attitude persisted for many years, as is indicated by the fact that up to 1896 not a single water treating plant had been built, although according to the International Railway Congress (1902) and the

A.R.E.A. (1904) the purification of water had been practiced in European countries for many years. That this has improved is indicated by the fact that by 1915 there were 31 railroads using such facilities and 45 using internal treatment while at the present approximately 1,000 treating plants of greater or less efficiency have been placed in service, treating 12 per cent of the total water consumption, also by the frequency with which the subject of water improvement has been mentioned in corporation reports, by the further fact that in the last five years there are several instances where presidents and directors are known to have personally interested themselves in water purification work and by the noticeable extent to which higher officers are conversant with the technic of the subject. The continuance of this attitude is a vital factor in the complete solution of the pitting problem if from no other view than the well established truth of railway ad-



Superheater Tubes Are Not Immune from Pitting

ministration that a sincere interest at headquarters invariably operates as a spur to interest and effort in the organization.

Increased Specialization and Organization Will Aid

Another mark of progress in pitting control is the conspicuous trend towards specialization in this work. One aspect of this is the special cognizance given to pitting and corrosion now as compared to an earlier period. Thus while a committee of the Master Mechanics' Association as recently as 1915 found very few roads specially treating water to prevent corrosion, special treatment commands attention generally at present, even in the literature of business houses engaged in related phases of boiler work.

Then there is another aspect to this trend. Back in 1872 George Brooks of the Brooks Locomotive Company urged specialization as essential to the solution of the ills from impure water and leaders in the Master Mechanics' Association repeatedly urged the employment of specialists for this purpose in subsequent years. To some extent the recommendations met with success and yet (for purposes of comparison) it is appropriate to mention that as recently as 10 years ago, according to the writer's investigation, there were on the railroads of this country and Canada less than 10 expressly designated system water supply officers having sufficient standing to be included in official listings of general circulation. That a notable change for the better has occurred in this direction is

shown by the listing of more than 30 of these general officers at the present time, some of whom are specially trained in water conditioning work and have a staff of assistants, with more or less suitable facilities and materials with which to work, and, of more importance, at least some real authority.

The added significance of this is, of course, the corresponding growth it represents in organizing water supply work so as to afford the supervision and co-ordination throughout the whole fabric of operations, essential to results where water conditioning work is carried out on any appreciable scale. When it is recognized that any one of a hundred or more changes in conditions—mechanical, climatic, operating, etc.,—might seriously affect results one way or another if unforeseen or not understood by those responsible for them (to say nothing of the absolute neglect to take corrective measures or the incompleteness and eventual discard of measures that have typified conditions in the past when the work has been everybody's and the responsibility nobody's), it is evident that from the standpoint of solving the pitting problem the significance of this trend cannot be minimized.

Technical Organizations Are

Also Studying This Subject

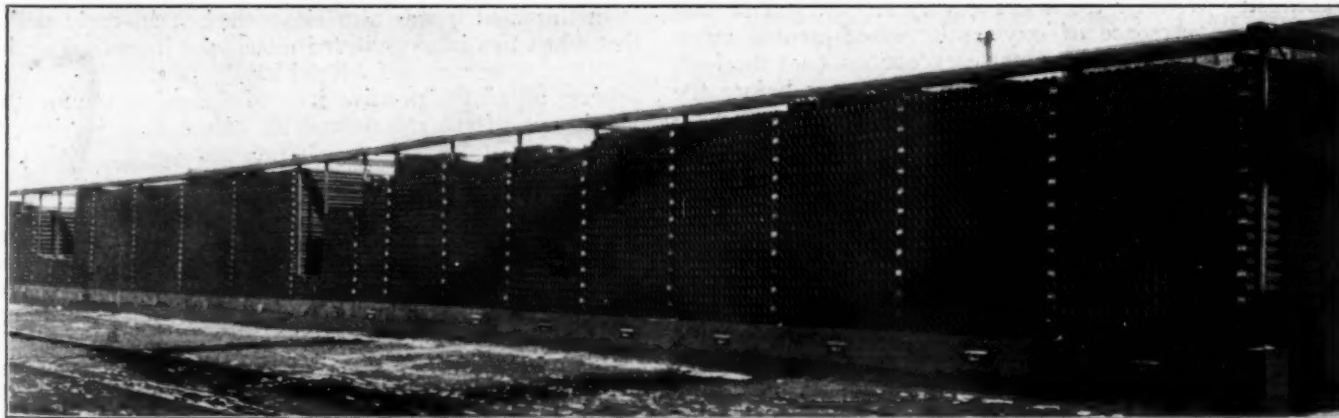
Another important step in the suppression of pitting is the attention being directed specifically to pitting and corrosion problems by technical organizations. Prominent among these, because of its immediate interest in the pitting of locomotive boilers, is the American Railway Engineering Association. This association has had the general subject of water treatment under study for many years and by an understanding with the American Railway Association is the recognized research body for the railroads in this field at present. Pitting and corrosion was assigned to the Water Service committee of this association for study in 1920 and has since been continued from

control of pitting in a field in which the personal element enters as extensively and vitally as in this,—where to some extent every engine crew and roundhouse and boiler foreman, as well as pumphouse man and even those in charge of handling boiler sheets and flue stocks are factors in the problem.

But the American Railway Engineering Association is not alone in its investigation of pitting and corrosion. An indication of the complicated nature of this problem is afforded by the investigation of the American Society for Testing Materials on a related phase of the subject over the past several years in co-operation with the United States Bureau of Standards and by more recently inaugurated work on this specific subject by the American Chemical Society, the American Electro-Chemical Society, the American Institute of Chemical Engineers, the American Society of Mechanical Engineers, the American Society of Refrigerating Engineers, the American Foundrymen's Association, the American Waterworks Association, the Master Boilermakers' Association, and the American Committee on Electrolysis. In addition the National Research Council has a Corrosion committee which, while doing no research work itself, endeavors to co-ordinate the work of the committee of other associations.

Last Decade Epochal in Water Work

Not only a great deal more knowledge but also a highly profitable fund of knowledge is available at the present time about the causes of pitting and grooving, however poorly disseminated, than was known ten or even five years ago. The last five years have been epochal in water treatment for certain of the knowledge that has been acquired. The events which are responsible for this are essentially four: (1) the overthrow of the carbon dioxide theory of pitting; (2) the confirmation of the electrolytic theory of corrosion; (3) acquiescence in the corrosibility



More Than a Two Years' Supply of Flues on an American Railroad in 1922—Slow Moving Stocks of Flues That Have Not Been Properly Sheltered Are Now Considered Detrimental by Causing Incipient Corrosion That Hastens Their Destruction in the Boiler

year to year as one of its principal subjects. Its constituency of 30 or more water service officers, chemists and engineers of tests from all sections of the country is representative of the talent in water supply and water conditioning work on the railways at present and among them are officers closely in touch with the immediate problems in question as well as with current thought and investigation on the subject, including some meritorious work done or sponsored by supply interests. Its reports show the drift of thought and must be considered as valued factors in the general educational work among railway officers essential to successful results in the con-

of sodium sulphate (Na_2SO_4) hitherto considered a "neutral" salt in all things but foaming, and (4) a wide recognition that properly concentrated solutions of caustic soda (NaOH) and carbonate of soda (Na_2CO_3) are inhibitors of boiler pitting.

In general, progress in this direction began with the discovery that water treatment in many cases was not stopping pitting and that the theories under which it had been conceived failed to offer a satisfactory explanation for some of the phenomena that took place. Briefly the theory under which chemists and railroads operated until a surprisingly late date was that under which the phen-

phenomenon was attributed to the action of acid upon the weak spots in the boiler metal. Thus up to 1907, as reputable authorities on chemistry as Treadwell and Hall relied upon this acid theory to explain the rusting process. According to this theory the acid could be in the natural water or it could result from the disintegration of the scale that was deposited in the boiler, or as a product of the reaction which took place when some of the early forms of boiler compounds were dissolved in the water.

Thus, it was readily conceived and demonstrated to the satisfaction of all that mine waters were corrosive because of the sulphuric or other acid found in them. Again, magnesium chloride found in the scale on flues or in the sediment around mud rings and on belly sheets acquired a reputation as a pitting agency on the theory that under the heat of the boiler hydrochloric acid was formed. But carbon dioxide dissolved in the water (the old standby in explaining rusting) was particularly considered a boiler pitter inasmuch as it then formed carbonic acid,—the same that gives natural water the power to dissolve limestone and to take some of the other substances in solution that form scale when precipitated under heat in the boiler. The extent to which it was relied upon by some in railway work to explain pitting in all but mine water territory is suggested by the following statement from a prominent source in 1913 that "Carbonic acid is the great and almost the only corrosive agent in boiler water" and a subsequent expression from the same source in 1916 that "pitting is due to carbonic acid in the water."

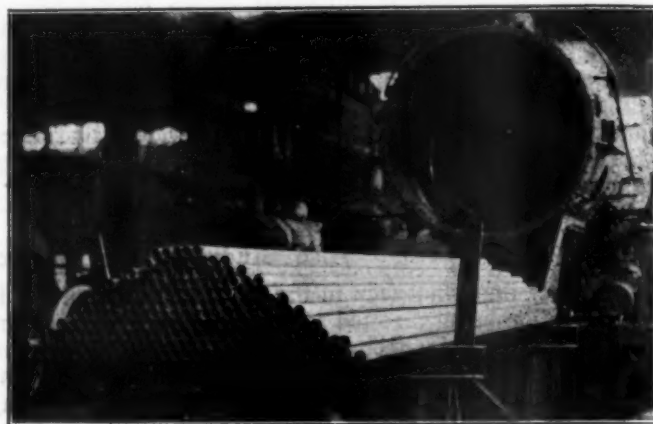
This was the period when the chemistry of water treatment was acclaimed for the simplicity of its concepts and the perfection of its action. Thus the opinion of S. W. Parr, of the University of Illinois, in 1906 that "The problems connected with railway (water) service involve no very profound chemical principles" was affirmed by a railway water expert in 1912 with his assertion that "there was nothing to improve in the chemistry of the subject" and reaffirmed in 1919 when the latter declared that "the chemistry of water treatment is very simple." This was before the presence of oxygen in water created much concern and when, with notable exceptions (not the least among which is found in Scrugham's paper before the Master Mechanics' Association in 1900), it was commonly supposed in the railway field from the decisive tone of expressions from spokesmen in the work that sodium sulphate (Na_2SO_4), to quote one source, was a "perfectly soluble and harmless" salt and that "water containing sodium sulphate," as another authority stated in 1912, "is not injured for boiler water." At any rate, it was a period when it was thought that pitting, with few exceptions, would be eliminated (1) by keeping acid-forming incrustants out of the boiler by treatment or repeated boiler washings; (2) by prohibiting the use of any compound which would produce acid, and (3) by neutralizing any acid waters with chemicals. Coincidentally, attention was given to the procurement of boiler materials as free as possible from the rough spots and weak spots which made them more susceptible to acid.

There is no question but that the application of the theory produced results, but its inadequacy for all contingencies became apparent when treatment with lime, "the neutralizer," by no means stopped all the pitting. It was at this juncture that the discoveries in the field of electro-chemistry began to exert their influence upon thought in the railway field, notwithstanding the little hope entertained in some quarters for relief from this direction, as aptly illustrated by the utterance from a prominent source as late as 1916 for instance, that "there is neither chemical nor electrical action in our boilers due to anything in the water," although it is significant that as early

as 1894, in a work on rustless coatings for iron and steel, Wood wrote in part as follows: "That there is a continual electrical action of a most complex character present in all boilers under steam can scarcely be doubted."

The Modern Conception of Pitting

It was early established that by far the greatest number of chemical substances, no matter how stable in the dry state, do not retain their original form when dissolved in water but, instead, that a certain percentage of the substance (depending upon the concentration of the solution and the amount of other substances present, etc.,) splits up into particles, each of which carry electric charges. These particles, called ions, are so constituted that half



There Are Large Economies in Prolonging Tube Life

are negatively charged and half are positively charged. Thus, when sulphuric acid (H_2SO_4) is dissolved in water a certain percentage of it splits up or becomes ionized, forming H^+ ions, which carry a positive charge and SO_4^- ions, which carry a negative charge.

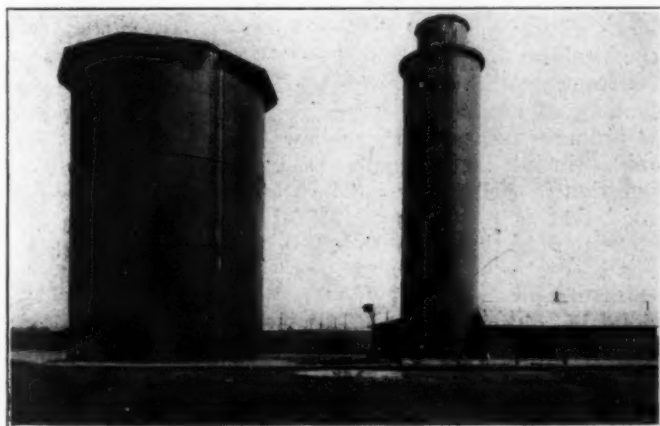
In this field it was also established at an early period that when two interconnected metals are immersed in this solution, a current of electricity is produced. In the process all of the positive ions of the solution move towards one of the metals and all of the negative ions to the other metal where the charges are surrendered, producing the current. The other characteristic of this process is that eventually one or both metals are eaten away, whereupon the current ceases. It is observed that this entire process can take place without the aid of electric or other energy from the outside—the identical condition of the electric battery. It was not long before this process became established thoroughly in the industries for the generation of electrical current, for electro-plating work and also for the production of many chemicals. Its applicability to the processes of corrosion was established in 1907 when Cushman, Walker and others, working in large part independently of each other, challenged the long-lived theory that the process of rusting required carbonic or other acid (as ordinarily conceived), and declared that the process of all corrosion of iron is fundamentally electrolytic.

Briefly, this theory as applied to the locomotive boiler presupposes that wherever corrosion occurs a condition exists identical to that of a battery, which comprises two points of difference in the metal and their exposure to a suitable solution, or electrolyte as such solutions are called. The first stage of the process is the solution of iron at the point of highest "potential." The second stage is the removal of this ionic iron as a result of its chemical combination with oxygen or as a result of some other agency or action. The action stops when the electro-motive force

created by the difference in the metal surfaces involved is destroyed or when the products of decomposition accumulate in such quantities as to polarize or otherwise to counteract the corrosive process or when the activity of the solution itself is rendered impotent. In the latter connection it is found that some substances, while perfectly good electrolytes, lessen the activity of pitting solutions and that in all cases the activity of the solution appears to bear a close relation to the concentration of ions of hydrogen in the solution, a fact which has led to the adoption of the practice of using the hydrogen-ion concentration as a measure of the corrosive powers of the solution.

The attention of the American Railway Master Mechanics' Association was called to this work as early as 1907 in a paper on the purification of water but it has not been until a very recent date that the influence of the work in this field has been felt. Its importance, however, cannot be minimized, particularly because of the means it affords of explaining many of the irregularities that constituted the pitfalls in early water purification. Thus, it does not challenge the early charges against acid water or the particular susceptibility to corrosion of rust spots on tubes, etc., but rather serves as an aid in understanding the actual process by which the destruction occurs. In addition, it clears up the controversy over the corrosive power of distilled water and among other things affords an explanation of the action that is found to take place in supposedly neutral water.

Consistent with this conception the causes of corrosion are limited only by the conditions that will produce electrolytic action in the boiler while the preventatives are limited only to those conditions, agencies, substances, etc., that will restrict electrolytic action. Thus while pitting (comprising all localized corrosion except grooving, which is the cutting of flues adjacent to the flue sheet) contemplates a region of sharp differences of potential, it is conceivable and it has been demonstrated that this difference



The Water Plant Can Be a Potent Factor in Pitting Prevention as it Has Been in Scale Removal

of potential may not result necessarily from the imperfections here and there in the chemical composition of the flues and sheets, but equally from the presence of points of unequal stress or from contact with other substances. It is likewise conceivable under this theory, how a coating of scale or other material may protect in some cases and not in others; how corrosion may proceed in alkaline waters; or even how temperature differences in the boiler may possibly be instrumental in the destructive process—the latter a thought of particular merit pending investigation for the aid it gives in explaining the grooving action. But especially the electrolytic aspect of boiler corrosion affords a more comprehensive basis upon which

to examine waters and undertake their correction and also in finding the immediate causes of pitting outbreaks. The recognition which members of the Water Service committee of the American Railway Engineering Association and others on railroads are now according this understanding of boiler corrosion after several years of discussion, and the interest manifested in learning more about it, is considered quite as decisive a step towards the solution of the pitting problem as is the attitude of boiler trouble students expressed in the representative statement that "the more study this question has been given the less it was realized was known about the subject."

Some Preventatives Have Been Found

But again progress in pitting control has not been confined alone to acquiring the modern conception of the process. Instead a marked advance appears to have been made in the study and application of cures. Of the events in this field probably the one of most practical importance is the general acceptance of discoveries to the effect that sufficiently concentrated solutions of caustic soda (NaOH) and carbonate of soda (Na_2CO_3) are inhibitors of corrosion. The problem contingent upon the use of these chemicals to the degree said to be necessary to the purpose, is that of avoiding foaming (for both are foaming salts) but the tone of reports of various experiments already carried out in railway service where the foaming trouble has apparently been met, tend so to confirm the earlier investigations of Cushman, Walker and others, and particularly the experiments conducted by the U. S. Navy in 1912, that increased efforts to apply this remedy for pitting in some form or other are certain. The fact is that some of these reports indicate that well directed efforts in this direction have been crowned with success.

While the above events are of the greatest importance in every consideration of pitting at the present time, it is also significant that other studies are now progressing on railroads which invite attention. Most prominent among these, perhaps is the study being made of the effect on pitting of dissolved oxygen, a substance that was mentioned among corrosives considered by some as early as 1904, but which was not given serious thought until after the work of Cushman and others, mentioned above. On the theory that this oxygen is the controlling factor in pitting in some waters by oxidizing and thereby continuously removing the ionic iron as it is produced under the electrolytic action, and on the strength of certain laboratory experiences and observations of pitted flues which are said by its advocates to strengthen the theory, (notwithstanding current doubts of its effect in boiling water) various tests are now being made with feedwater heaters in an effort to remove it before the water reaches the boiler. Thus the feedwater heater becomes a more important facility, for the present at least, than merely as a fuel economizer. The Pennsylvania and the Chicago, Milwaukee & St. Paul are among the roads conducting such experiments.

Other experiments being conducted at the present with the hope of correcting pitting, from which its advocates expect much, involve the counter-electrical method of treatment, a treatment which is patterned after a practice claimed to have been applied successfully in certain marine boilers. It provides essentially for the "application of an electrical charge to the boiler sufficient to counteract and neutralize the potential normally in the boiler,"—a treatment whose chief difficulty in winning support, pending the completion of experiments now under way, lies in the possibility of causing damage similar to that which it proposes to prevent, but which is of special interest for the knowledge its study may develop concerning a thermal electric activity suspected of being in the boilers,

and which, if established, may assist in explaining certain irregularities about the grooving action.

Rusted Flues Hasten Pitting

Among the most prominent of other experiments being carried on are the better care of new flues and sheets preparatory to installation. This is based on the theory that rusting lowers the resistance to pitting by destroying the protective coating afforded by the surface skin and, in some cases it seems, actually starts the pitting process; the use of alloy steel tubes, notably the copper content flue; the use of coated flues, notably the lead covered flue; the coating of boiler interiors with cement and other products, including the processes of rendering the surfaces resistant by pre-treatment with chromic acid, etc., and certain studies in metallurgy having as their object the improvement of the quality of the flues and sheets themselves, and of their proper support in the boiler.

Excerpts from the proceedings of the American Railway Engineering Association for 1925 indicate that status of the work in this direction and the conclusions it has drawn thus far. These excerpts in condensed form are as follows:

Results indicate that pitting and corrosion can be prevented by caustic soda and sodium carbonate.

The influence of oxygen is still under observation and it is too soon to report on the effect of its reduction by the use of open feedwater heaters or other available methods.

A consideration of chemical reagents has demonstrated the value of hydrates and carbonates of alkali.

The counter-electrical potential method of preventing corrosion is theoretically a solution of the problem, provided the mechanical difficulties in its application can be overcome.

The influence of suspended matter and scale is still under investigation.

The most destructive form of corrosion is due to mineral acid or to the source of these acids. An excess of caustic soda is believed to be an antidote for all acids.

Referring to the material on boiler construction we consider it imperative that the specifications be adhered to, as failure to do this may result in the use of non-homogeneous material which may set up detrimental electrolytic currents leading to corrosion.

Quality of Boiler Metal Paramount

The importance of the last conclusion cited, is expressed in the following statement of W. A. Powers, former chief chemist of the Santa Fe, who gave the subject of corrosion special attention for many years:

"I have investigated a large number of pitting epidemics, both on boiler tubes and firebox sheets and have never found a case in which the pitting was not due either to poor material or uneven strains caused by improper staying. The latter cause is much more prevalent than we ordinarily think and is not always readily detected, but a very close examination will show that the pitting is confined to certain areas on the firebox sheets. For instance, there may be pitting on the short radius but none on the crown sheet; again, there may be pitting on the throat sheet and nowhere else. Quite often it is on only one side of the stay bolts, all of which is due to local strains which evidently keep the material under a great tension at those particular places. Under these conditions the sheets will pit regardless of how good material is."

Another remedy is worthy of special attention as an indicator of the progress being made in pitting control. This is the successful resort to law that has been made recently to prevent the pollution of streams, on the ground that such pollution as will tend to impair the service of the railroad to the public through the destruction of its boilers is unlawful on grounds similar to the pollution of a public drinking supply. The outstanding case in this connection is that recently decided in favor of the Pennsylvania and upheld by the U. S. Supreme Court involving the pollution of the Indian Creek supply near Pittsburgh. The consequences of a decision of this character are too far reaching not to receive consideration in studies made to effect pitting control.

Practical Obstacles to Success

There is no question but that progress is being made in finding and also in applying remedies for pitting. There are many conditions which make some of the progress in this direction scarcely short of remarkable, even as they help to explain why some roads have not progressed farther in eliminating their pitting troubles. The complicated nature of the problem should be emphasized in this connection. Thus, not only does it present involved questions of chemistry and metallurgy but a situation replete with problems of practice and where changes are constantly taking place in operating conditions, boiler design and materials, etc., to say nothing of the changes in personnel. Thus the engine that is here today is somewhere else tomorrow; boiler sizes, pressures and duties have increased and various modifications made in use, as a result of which one problem is solved very often only to find a new one in its place.

Again, there are few men in the railway field who have had the time or resources at their disposal to carry out investigations essential to the solution of pitting problems. Thus the chemist is often also the engineer of tests, while the water service officers on the few roads that have yet appointed them are constantly required to divide their attention among various water supply activities, including the development of new supplies, superintendence and maintenance, with the result that even the general problems of water softening by one process or another can receive only a portion of their attention. Moreover, the problem has not been simplified by the common failure of the mechanical department to keep such records as will afford the data essential to a correct picture of conditions or, among other things, by a division of responsibility among conflicting interests.

In considering the progress in pitting control the fact cannot be overlooked that the elimination of pitting is largely a question of economics. The probabilities are that pitting would be far less now than it is if railroads were willing to spend the money for it. In this respect, the problem of pitting is identical with other problems confronting railroads, whether of an operating, maintenance or mechanical nature. The investment required is properly measured by the results to be gained. That this principle has actually been applied to the pitting question is well illustrated by the case of a certain railroad that is contenting itself at present with the substantial reduction of pitting in a certain territory that it has been able to secure by internal treatment simply because, from a careful consideration of the damage being done by pitting and the cost of remedial measures, it cannot justify the expense of more complete treatment until traffic increases warrant it.

Thus each road must largely determine its own progress in pitting control. Where a road, however, is properly organized and manned, as many are at present, and wants the elimination of pitting badly enough, certainly the solution of pitting does not constitute the formidable nor even the expensive problem that it is often surmised to be.

THE AMERICAN CONCRETE INSTITUTE will hold its twenty-second annual meeting at the Hotel Sherman, Chicago, on February 23-26. At the opening session Frank H. Alfred, president and general manager of the Pere Marquette, will present a paper on reinforced concrete track support for railways. Following this a number of railway engineers have been invited to participate in a discussion on "The Railroads and Concrete." The remainder of the program will be devoted to the consideration of a wide variety of problems involved in the mixing and placing of concrete for various purposes.

Reports Required by I. C. C. Held Necessary

*Suggests that large proportion of data is required by carriers
for operating and administrative purposes*

WASHINGTON, D. C.

IN the judgment of the Interstate Commerce Commission none of the reports which it now requires of the railway companies can at the present time be eliminated without detriment to the public interest, according to a report made by the commission to the Senate in compliance with a Senate resolution dated January 4, proposed by Senator Reed of Pennsylvania. This directed the commission to furnish a statement showing in detail the number and nature of the reports which it requires of the railways, those required by state commissions, the expense to the railways of preparing such reports, and the number and nature of the reports which in the judgment of the commission could be dispensed with. The commission says it is unable to give a statement of the expense; but it describes and gives the reasons for the reports which it requires and in an appendix gives a list from such information as was available to it of the state reports. The report says in part:

"In general the reports are either made necessary by some specific administrative duty with which we are charged or are essential to obtain requisite information as to the economy of the operation of the railways, the service rendered to the public, the charges therefor, and the financial condition of the railway companies. For the most part the reports cover matters which railway officials need for the efficient conduct of their business, as will be more fully shown below.

"The Interstate Commerce Commission is not officially advised of the particular requirements of the various utilities commissions and public service commissions of the several states as to reports from railway companies; and, in view of the obligation of transmitting to the Senate at the earliest possible moment a response to Resolution No. 100, an effort to collect authoritative information in this respect through formal inquiry appeared to be impracticable on account of the delay that would ensue. Reference is here made, however, to the Appendix to this report which contains lists of reports, by states, that, though subject to correction, are understood to be fairly indicative of the kinds of reports respectively rendered to them by railway companies.

"The matter of the expense to the railway companies of preparing reports required from them by the Interstate Commerce Commission, federal departments, and state regulatory bodies has long been the subject of extensive discussion and consideration, and earnest attempts to estimate such costs have been made; but the data secured have been too incomplete and otherwise unsatisfactory to justify the statement of any definite amount as fairly representative of the total expense, or especially of that portion of it which might be wholly attributable to requirements of the Interstate Commerce Commission in respect to returns, whether they are made in pursuance of specific provisions of acts of Congress, or are otherwise deemed necessary to the proper performance of duties incumbent upon the commission. In relation to the subject, it seems appropriate under the circumstances to say that, in the course of an extended discussion by correspondence and otherwise between a member of this

commission and the president of the Railway Accounting Officers' Association in the year 1922, the subject being, 'Reports Furnished the Interstate Commerce Commission and the State Commissions,' the association's Committee on General Accounts furnished to the commissioner a copy of a report, which the committee had adopted, containing an explanation of the situation as it appeared at that time, such as seems to justify the extensive quotation from it which follows:

(Quotation Omitted.)

"The greater part of the regular reports received from railway companies are rendered in pursuance of requirements that accord with express provisions of various acts of Congress governing the Interstate Commerce Commission, or are necessary to their application, or else are intended to comply with the implicit purport of numerous provisions of those acts, or are otherwise deemed essential to the proper fulfillment of the commission's duties in many respects. After consideration of many conditions involved in the question of the elimination of reports now required from railway companies, it is appropriate to state that none of these reports, in the judgment of the commission, can at the present time be eliminated without detriment to the public interest.

"This statement should not be construed, however, as indicating that the commission is of the opinion that its existing requirements in relation to reports from railway companies and other corporations subject to its jurisdiction should indefinitely remain unmodified in either important features or in minor particulars, except for such changes as may be necessitated by amendments of laws now in force or by new enactments. On the contrary, it is the belief of this body that the practice respecting regular reports, followed since its organization, of seeking the advice and co-operation of officials of the corporations and other parties chiefly concerned with them, before deciding what forms for returns and what rules and regulations relative to them should be adopted or prescribed, should be continued. The procedure has, of course, varied with circumstances, and some departures, mostly due to special urgency, have occurred; but the intention of the commission to make a decision in such complicated matters only after careful consideration has constantly been observed. A similar course, when appropriate, has been pursued as to the questions of discontinuance or material modification of reports. Such matters are frequently far from simple, because of their interrelation with other things.

"To supplement the information given directly in answer to the preceding queries, it seems important to add the following comments and explanations:

"This response, so far as it pertains to the work of the Interstate Commerce Commission, relates mostly to regular annual and other periodical reports that are required of the railway carriers, as distinguished from brief informal reports required on occasion, as by telegram or letter in certain cases of train accidents, and such special returns or information as it may be necessary for the carriers to furnish in connection with hearings by the

commission on rate cases and other general or special investigations or proceedings as they arise.

"The reports formally rendered to the commission are not only various in purpose, form, size and character, but they also differ in respect to the difficulty and expense of preparation and the number of respondents respectively making them. No numerical summary of the individual reports received by the commission in a definite period has been made for the evident reason that the total number of reports filed, even if subdivided by classes, would have little, if any, real significance.

"The commission's requirements, as to reports, are graduated to a large degree in accordance with the importance or character of the companies, with the result that the smaller carriers are benefited by many exceptions in respect to details in annual reports, and by the omission of quarterly and monthly reports.

"An important fact, often overlooked, is that a very large proportion of the statistical data and other information included in the reports to the commission is required by the carriers themselves for purposes of administrative control and operating management, and that it is impossible to determine the amount to which the supplying of such data and information to the commission adds to their otherwise necessary expense. A distinction should be noted, however, between reports required by governmental bodies and those which are made for railway officers and organizations, as reports of the latter sort can be amended, deferred, or even abandoned, at any time, under suitable authority; but since reports to government bodies are usually made pursuant to legal requirements, they must, therefore, be more carefully prepared and analyzed, and are consequently somewhat more expensive. In general, it may be stated that there has been a continual co-operative effort between representatives of the commission and the carriers to dispense with such reports, or parts of reports, as from time to time may be found unnecessary because of changed conditions. Many modifications in details of reports have thus occurred, and occasionally a report has been discontinued; on the other hand, circumstances have at times made it appropriate to require some new report, or the amplification of an old one.

"It also seems appropriate to mention that, though the reports regularly submitted to the commission are primarily for its information and use, most, if not all of them, are by law held as public records and so they are directly accessible to the public. Many reports compiled from these official returns, however, are issued in printed or other form, by means of which the commission makes a large amount of various authoritative statistical information conveniently available, although the publication of such reports in print is necessarily restricted within narrow limits by its appropriation for printing.

"It may be remarked that the value of the corporate returns in the files of the commission is increasing, not merely as current records, but also for purposes of research and investigation, both to the commission and to the public. The statistical details in the reports filed, parts of which are requisite for other uses than publication, permit the commission to respond to frequent requests from senators and members of the House of Representatives for special statistical statements and other kinds of information pertaining to common carriers, and to furnish to other departments of the government and to the general public, information that is constantly called for pertaining to various phases of the subject of transportation."

The commission also called attention to the recommendations in its annual report that Congress rescind the requirement that it compile a schedule of ship sailings and the monthly report on condition of equipment.

Appropriation for I. C. C. Recommended

WASHINGTON, D. C.

APPROPRIATIONS for the Interstate Commerce Commission amounting to \$6,153,157 for the ensuing fiscal year are recommended by the House appropriations committee in the independent offices bill reported to the House on February 15, in accordance with the Budget estimates. An appropriation of \$1,189,250 was available for the current fiscal year for the Bureau of Accounts, of which it was proposed to expend \$717,665 to keep the work of that bureau current, and \$471,585 to bring to date the work required under section 15a of the transportation act. The commission was unable to secure competent employees because of the uncertainty of continued employment and consequently the recapture work under section 15a cannot be brought to date during this year. The committee therefore recommends that the unexpended balance of this appropriation be continued available during 1927. In addition to this unexpended balance the sum of \$1,035,269 is recommended to be appropriated, which it is proposed shall be expended as follows:

To keep the work of the bureau current.....	\$717,665
Policing of carriers' accounts (sec. 20).....	317,604
Total	\$1,035,269

For the enforcement of the acts to promote safety of employees and travelers upon railroads, and the investigation of block-signal and train-control devices, \$650,000 was appropriated for the current fiscal year. The committee recommends that for the fiscal year 1927 two paragraphs of appropriation be made, separating the activities of the Bureau of Safety, providing in one paragraph \$475,000 for the investigation of safety systems, and a new paragraph appropriating \$138,320 for the investigation of block signal and train-control devices.

For the Bureau of Valuation the committee recommends an appropriation of \$1,427,960 for the fiscal year 1927, which is \$518,592 less than the amount available for the current year. To make use of available data, and to complete the primary valuation work, the committee adopted a three-year program in making appropriations for strictly valuation work, as follows:

Fiscal year 1926 (appropriated).....	\$1,555,602
Fiscal year 1927 (recommended).....	1,037,010
Fiscal year 1928.....	915,264
Total	\$3,507,876

In addition to the above, order No. 3 of the Bureau of Valuation provides for bringing up to date the primary valuations as used in determining recapturable excess income under section 15a of the transportation act. To provide for the necessary engineering forces required under section 15a work additional funds are required, so that in addition to the sum to be made available for strictly valuation work, there must be appropriated sufficient sums to enable the bureau to perform recapture work under section 15a, and order No. 3 work. The appropriation for the current fiscal year and the recommended amount for 1927 may be divided for these three classes of work as follows:

Object	Appropriated for 1926	Recommended for 1927
Valuation work	\$1,555,602	\$1,037,010
Order No. 3 work.....	137,350	137,350
Recapture under sec. 15a.....	253,600	253,600
Total	\$1,946,552	\$1,427,960

During the present fiscal year the Bureau of Valuation has been unable to secure a sufficient number of competent employees to complete the program of work outlined for the year, and the committee, anxious to see the

primary valuation work completed within the total of the appropriations outlined in its three-year program, recommends that the unexpended balance of the appropriation for 1926 be continued available for the same purposes during 1927.

For printing and binding for the Interstate Commerce Commission the committee recommends an appropriation of \$160,000 for the fiscal year 1927, with the provision that no part of that sum shall be expended in printing the "Schedule of Sailings" required by section 25 of the interstate commerce act. Approximately 4,100 of these documents are distributed every month at a cost of \$9,000 per annum, in duplication of similar lists furnished by the Shipping Board.

Under the head of "general expenses" the bill provides for an appropriation of \$2,318,660, the same as for this year.

The bill also provides for an appropriation of \$285,220 for the Railroad Labor Board.

In a statement before a subcommittee of the appropriations committee on February 6 Commissioner Esch outlined the large increase in the work of the commission in recent years and asked that the appropriation recommended by the budget bureau be not reduced. He said that of 667 applications for the six-months guaranty for 1920 only 46 are still undisposed of and of 390 applications of short lines for reimbursements of deficits for the federal control period all but 64 have been disposed of. The Hoch-Smith rate resolution, requiring a general investigation of the rate structure, he said "was a large order and will take much time and require much money," although no special appropriation was made for it, and the commission's forces are inadequate for it now. Asked for a statement of the expense of the hearing on the application of the western railroads for a rate advance, with which was combined the rate investigation, he submitted the following:

"There have been engaged upon this hearing for practically one year our director of traffic, one assistant director of traffic, our director of statistics, chief examiner, and four attorney-examiners who have devoted the substantial part of their time to the hearing. Their total annual salary is \$51,400. There have also been assigned exclusively to this investigation since December 2, 1925, six of our junior rate examiners whose total annual salary is \$21,900. This does not of course include the time nor expense of the commissioners devoted to the subject."

While the commission has not expended any of the \$50,000 appropriated for "special services," Mr. Esch said it is very likely it will have to do so in connection with the Hoch-Smith investigation and possibly in connection with the investigation of the Chicago, Milwaukee & St. Paul, on which 26 of its examiners were engaged for six months. The commission was unable to obtain sufficient employees to make the progress expected with the recapture work and the policing of carriers' accounts due to the uncertainty of employment because of the recent fluctuations in the amounts which Congress has appropriated for accounting work. In discussing the item of rent Mr. Esch said that sometimes the commission has had as many as 13 hearings going on at one time, some of them in hotels.

In connection with the appropriation for printing Secretary McGinty said that the commission is now a year and a half behind in the publication of its volumes of decisions. Commissioner Esch also pointed to the unnecessary expenditure required for the publication of the "Schedule of Sailings" and also the preparation at a cost of about \$5,000 a year of the monthly report on condition of railroad equipment, directed by a Senate resolution proposed by Senator La Follette in 1923 after the shopmen's

strike, which he said is no longer required, as the information is given in other reports. Incidentally he pointed to some items of revenue which come to the government by reasons of the commission's work, including about \$24,000 for its publications sold by the Government Printing Office, and penalties collected from railways as a result of prosecutions. Those collected as the result of activities of the Bureau of Inquiry amounted to \$147,500 in 1925; those under the Bureau of Locomotive Inspection to \$6,000; those under the Bureau of Safety to \$80,500. Also the government has received some \$58,000,000 in interest since the transportation act was passed on loans to the railways at 6 per cent while the cost to the government was $4\frac{1}{4}$ per cent.

Secretary McGinty gave the present distribution of employees of the commission as follows:

Under the appropriation for—	
General purposes	770
Accounts	250
Safety	119
Locomotive inspection	89
Valuation	534
Total	1,762

Mr. Esch submitted a statement prepared by Director Wylie of the Bureau of Accounts showing that on December 31 there were 707 recapture examinations to be made and 378 were added to the docket in January. An effort was made to employ 300 men for this purpose but 50 of the higher grade positions remain vacant and 26 of the best field men were diverted to the St. Paul investigation. The estimate of \$1,035,269 for the Bureau of Accounts for 1927 was based on a force of 250 men for recapture work, to which \$717,665 of the total was allotted for current work, and \$317,604 was for the policing of railway accounts under section 20, which was omitted from the appropriation for this year. A total of \$417,585 was also appropriated for this year to bring the recapture work up to date but was not all expended because of the difficulty in hiring men for work that appeared temporary.

Commissioner McManamy testified regarding the work of the locomotive and safety bureaus.

Commissioner Lewis described the progress of the commission's valuation work. He said under the policy adopted by Congress last year of making appropriations for the purpose of completing the primary valuations in three years "we have been able to extricate ourselves and the work from the gloom that had settled down upon it," although it was impossible to obtain a sufficient force to take full advantage of the increased appropriation. On December 31 hearings had been completed in 258 cases; on January 31 hearings had been completed in 284 cases, covering 64,872 miles, and hearings had been partly completed in 138 more cases representing another 64,876 miles. Six-hundred-and-ninety-nine reports have now been served on the carriers and 100 more are going through the process of review. Efforts are now being centered on the valuations of the larger roads. He urged the importance of maintaining the three-year program by making the unexpended balance of this year's appropriation available next year.

As to the time when the valuation can be brought up to date, Mr. Lewis said much will depend on whether Congress changes the law which now requires that valuations shall be brought up to date "in like manner," that is, by the process by which the primary valuations were made, and that there are two or three schools of thought as to how the underlying valuations should be brought up to date, some saying that adding net investment since to the ascertained value as of 1914 is "a great deal like mixing oranges with apples." At all events, he said, the commission knows the approximate values and has "better testimony than anybody else possibly can present as to value."

Hearing on Consolidation Bill

WASHINGTON, D. C.

A STATEMENT outlining the kind of legislation to amend the consolidation provisions of the transportation act desired by the railway executives was begun before the Senate committee on interstate commerce on February 16 by Alfred P. Thom, general counsel of the Association of Railway Executives. He said the Cummins bill contains many valuable features and he had no desire to speak in a spirit of criticism but that he thought it had failed to provide, except by inference, for many practical difficulties which arise from the corporate structure of the railways and the various state laws, which should be specifically recognized. He approached the subject on the assumption that the government has already approved a policy of consolidation and said the railways had instructed him to urge a permissive rather than a compulsory plan of consolidation and also the provision of adequate machinery for accomplishing the desired purpose. The process should be one of evolution, Mr. Thom said, and the railways should be allowed to propose plans to the Interstate Commerce Commission while it might approve or disapprove or withhold its approval of unless certain changes were made, such as the inclusion or exclusion of a particular road. He said the railways do not favor the provision of the Cummins bill which provides a power of condemnation by which one road might acquire another in case of a failure to agree on terms, but that they believe the commission should have power to permit a consolidation to go ahead without some line which it might think ought to be included, in case it would not accept the terms proposed. While the commission might suggest the terms, he said, the roads ought to be allowed to decide on whether to avail themselves of them.

Mr. Thom said he had prepared a bill, not for the purpose of having it introduced, but for the purpose of meeting what the railways consider the practical requirements, and that it has been subject to the close study of the law committee of the association, which includes the general counsel of the principal railways, for nearly two years, and he hoped that it would be possible for Senator Cummins and the committee to accept some of its suggestions as a method of facilitating the carrying out of the consolidation policy. In it an effort has been made to deal with every corporate situation and every situation that arises under state laws. When he mentioned the draft of a bill prepared by the Interstate Commerce Commission and said that it did not include machinery for dealing with some of these situations Senator Cummins remarked that the commission's bill was not before the committee.

An illustration of one of the points to be covered Mr. Thom said that the power to acquire properties should be broad enough to include all the properties owned by a railway to be acquired, and not confined, as in the Cummins bill, to "railway properties." He pointed out that the most important manner of consolidation would be by the existing large systems acquiring their subsidiaries and then some other properties, rather than by the formation of new companies to take over existing lines, and that in many cases it would be important to include other than railway property already covered by the capitalization of a railway. Senator Cummins said it might be well to permit such acquisition provided the non-carrier property is not included in a valuation for rate-making purposes.

Mr. Thom also said that a policy of consolidation can only be justified on the principle of strengthening systems, not making them weaker, and that a property should not be required to be included except on terms commercially justified.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended February 6 amounted to 914,904 cars, a decrease of 14,226 cars as compared with the corresponding week of last year and an increase of 8,887 cars as compared with 1924. The Pocahontas, Southern and Southwestern districts showed increases as compared with last year and small increases were also shown in the loading of coke, merchandise and miscellaneous freight, but the other classes of commodities showed decreases. The largest reduction was in coal loading, which was 17,267 cars less than that for the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

REVENUE FREIGHT CAR LOADING—WEEK ENDED FEBRUARY 6, 1926

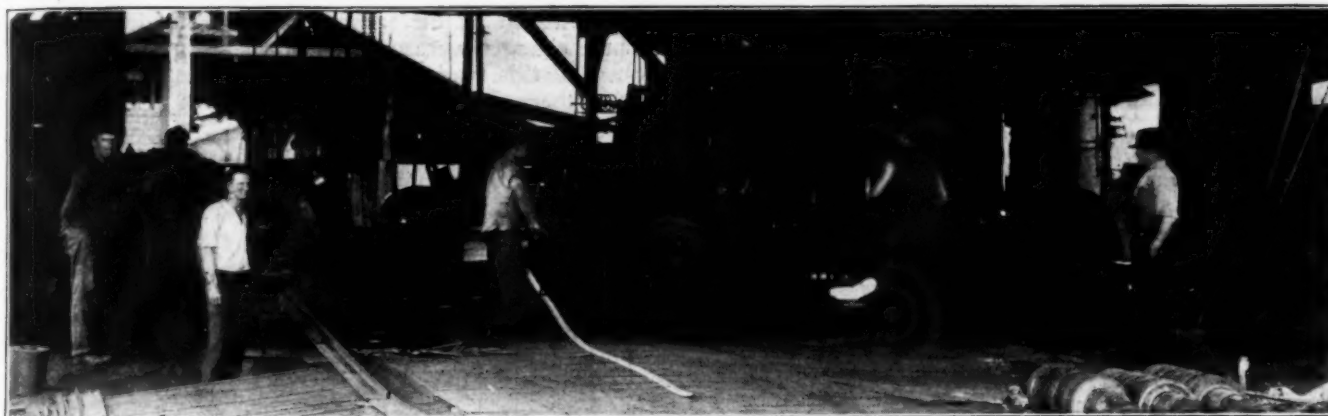
Districts	1926	1925	1924
Eastern	203,889	215,605	221,815
Allegheny	185,459	192,245	190,943
Pocahontas	54,582	49,639	42,780
Southern	148,826	145,070	146,195
Northwestern	116,732	119,412	108,485
Central Western	137,360	139,809	137,410
Southwestern	68,056	67,350	58,389
Total Western districts	322,148	326,571	304,284
Commodities			
Grain and grain products	44,643	48,002	46,260
Live stock	29,534	32,809	32,103
Coal	175,964	193,231	199,745
Coke	18,704	13,180	12,674
Forest products	71,780	77,431	78,503
Ore	10,171	11,491	9,753
Mdse. L.C.L.	248,499	244,875	234,349
Miscellaneous	315,609	308,111	292,630
Total	914,904	929,130	906,017
February 6	914,904	929,130	906,017
January 30	925,263	897,368	929,623
January 23	921,734	924,291	891,481
January 16	936,655	934,022	894,851
January 9	907,119	934,170	872,023
Cumulative total six weeks	5,346,914	5,386,079	5,200,287

The freight car surplus for the period ended January 31 averaged 250,935 cars, a decrease of 13,846 cars as compared with the preceding period. This included 92,040 coal cars and 113,860 box cars. The Canadian roads for the same week had a surplus of 23,340 cars, including 18,570 box cars and 300 coal cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended February 6 totaled 54,898 cars, an increase over the previous week of 1,537 cars, grain accounting for 542 cars of this, merchandise for 448 cars and miscellaneous freight for 696 cars, decreases being recorded in lumber and other forest products. Grain showed an increase in the eastern division but a decrease in the western division. Compared with the same week last year there was a decrease of 1,240 cars.

Commodities	Total for Canada			Cumulative totals to date	
	Feb. 6, 1926	Jan. 30, 1926	Feb. 7, 1925	1926	1925
Grain and grain products ..	6,929	6,387	6,617	41,103	32,638
Live stock	1,910	1,731	2,161	10,513	12,283
Coal	5,135	5,293	6,375	27,544	29,997
Coke	467	471	282	2,225	1,531
Lumber	2,945	3,123	2,798	14,301	13,560
Pulpwood	4,315	4,276	4,545	19,689	20,698
Pulp and paper	2,773	2,686	2,265	13,361	10,374
Other forest products	3,722	3,919	3,799	16,734	15,742
Ore	1,431	1,348	1,689	7,021	5,728
Merchandise, L.C.L.	14,404	13,956	13,596	70,391	66,853
Miscellaneous	10,867	10,171	9,456	50,920	47,930
Total cars loaded	54,898	53,361	52,983	273,802	257,334
Total cars received from connections	36,632	35,036	34,922	170,941	165,538



In the Rolling Mill at South Tacoma, Wash.

Northern Pacific Purchases on Pre-War Basis

Better relation of procurement costs to revenues and traffic attach significance to improvements in stores

TABLES published herewith show that the Northern Pacific expenditures for materials and supplies have ranged from \$22,000,000 to \$44,000,000 per year during the last decade, including from \$7,000,000 to \$13,000,000 for fuel; \$1,000,000 to \$2,000,000

regularity. Yet, in the face of the decreasing tonnage of the northwest, and the uncertainty of income attendant upon the high operating costs and limited revenues, this road began a program of additions and betterments to its stores facilities in 1921 which, when completed in 1924, had cost the company in the neighborhood of \$600,000.

Store Facilities Improved

This work involved the construction of new storehouses, lumber sheds and warehouses, dry kilns, new



Northern Pacific Supply Trains Are Equipped with Locomotive Cranes

for rails; \$1,000,000 to \$2,500,000 for ties, and from \$10,000,000 to \$26,000,000 for storehouse materials. It has been carrying from \$10,000,000 to \$17,000,000 of stock on hand during the same period, comprising from \$800,000 to \$2,275,000 of fuel; \$1,000,000 to \$2,500,000 of rails, \$750,000 to \$2,125,000 of ties, and from \$5,000,000 to \$10,000,000 of other materials. This is at the rate of from \$3,600 to \$5,000 per mile for purchases and from \$1,100 to \$2,400 per mile for balances, or from 9 to 16 per cent of the annual operating expenses, which, while suggesting a swollen condition in places, could hardly be considered alarming, especially in the case of purchases, which followed disbursements with noticeable

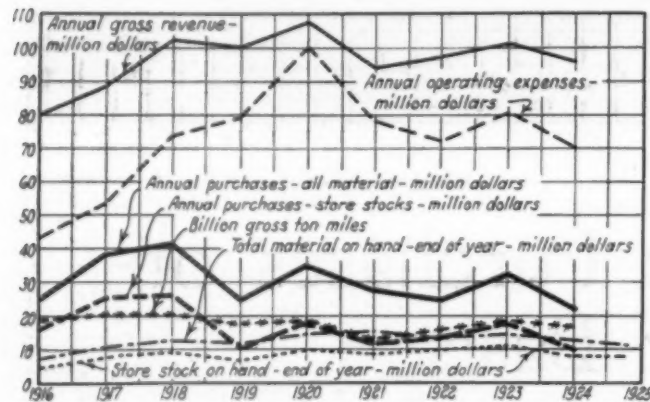


A Portion of the Storage Platform at Como Shops, St. Paul, Where Coach Materials Are Kept

reclamation facilities, locomotive cranes, a gantry crane, motor trucks, oilhouse pumps and oil storage tanks, together with a variety of minor improvements in existing plants. The dry kilns were described and a report of the

results from their operations given in the *Railway Age* of July 18, 1925. Coincidentally with these additions to the property, stocks were overhauled and a variety of modifications introduced in methods. The American Railway Association's standard stockbook was placed in service at all points, supplemented by a set of master stockbooks in the general office at St. Paul under proper supervision. Wall shelving was torn out and store interiors otherwise rearranged to accommodate the installation of racks of standard dimensions and of approved

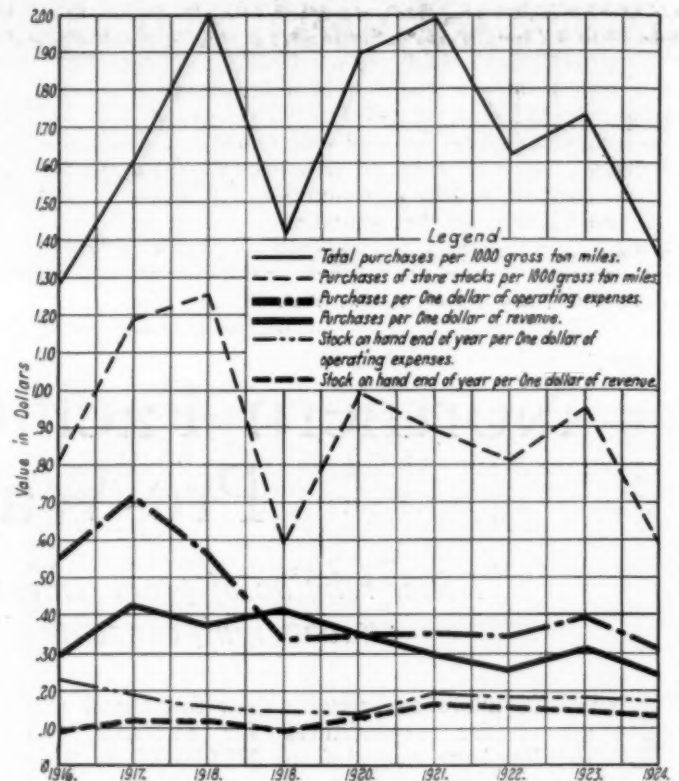
being prepared by the railroad's accounting department. These changes were put into effect in rapid succession. Officers of this road are authority for the statement that the Northern Pacific has proceeded with the improve-



Charts Showing the Comparative Trends of Purchases and Stock Balances with Revenue, Operating Expenses and Traffic

style which, in the interest of uniformity, were formed in rows down the length of the building and separated by a single main aisle.

In all new buildings and in large part in the old buildings, portions of the backs of shelving were eliminated and other obstructions to light removed, including the practice of hanging tinware, etc., from ceilings and walls except in the few cases where space limitations offered no escape from it; and all stores interiors, including racks and ceilings were painted in light colors, while the practice was also adopted of spraying all outside platform materials. All material was re-classified in accordance



The Relation of Purchases and Stock Balances to Revenues, Operating Expenses and Traffic

ments cited largely on the theory that "confusion is waste, while order and neatness make for economy." However sound the theory, the work of the last four years has been productive of order and neatness. A char-

MATERIAL PURCHASED

RESERVES*

	Fuel	Rail	Ties	Other Material	Total Purchases	Total Material	Other Material
1916	\$7,035,252	\$1,242,790	\$1,062,418	\$15,423,897	\$24,764,359	\$7,399,905	\$4,816,193
1917	9,700,507	1,708,835	1,507,024	25,399,593	38,315,961	10,678,318	7,936,804
1918	11,710,003	1,203,236	2,328,850	26,285,123	41,527,213	12,712,692	8,899,059
1919	9,986,405	1,961,058	2,469,521	10,445,672	24,862,656	11,032,819	6,436,985
1920	13,885,305	1,251,501	2,379,166	17,126,707	34,642,681	14,372,325	9,405,147
1921	11,942,912	1,189,910	2,145,242	11,815,707	27,093,772	15,084,505	8,176,051
1922	11,458,116	711,944	245,436	12,498,258	24,913,756	13,845,525	9,074,939
1923	12,275,528	1,135,404	1,444,553	17,125,795	31,981,282	14,701,475	10,332,210
1924	9,564,998	880,908	1,739,506	9,862,870	22,048,283	12,190,005	7,998,793
1925*	6,885,485	1,320,067	1,369,362	9,516,124	19,091,040	10,935,207	7,247,192

*Purchases over 10 months' period.

*Reserves show stock on hand at end of year.

with standard practice and stored in consecutive order with their descriptions in the stockbook. The system of unit piling was inaugurated, using trays on the shelving and island platforms for castings and other bulky materials, and the operation of the stores was organized on the sectional plan. During this period stores delivery was extended to 16 points, the supply car gave way to the supply train for provisioning line points and the A.R.A. classified material report came into use, the latter

characteristic of the facilities is the conspicuous uniformity in arrangement that now exists among the stores.

Basements in All New Stores

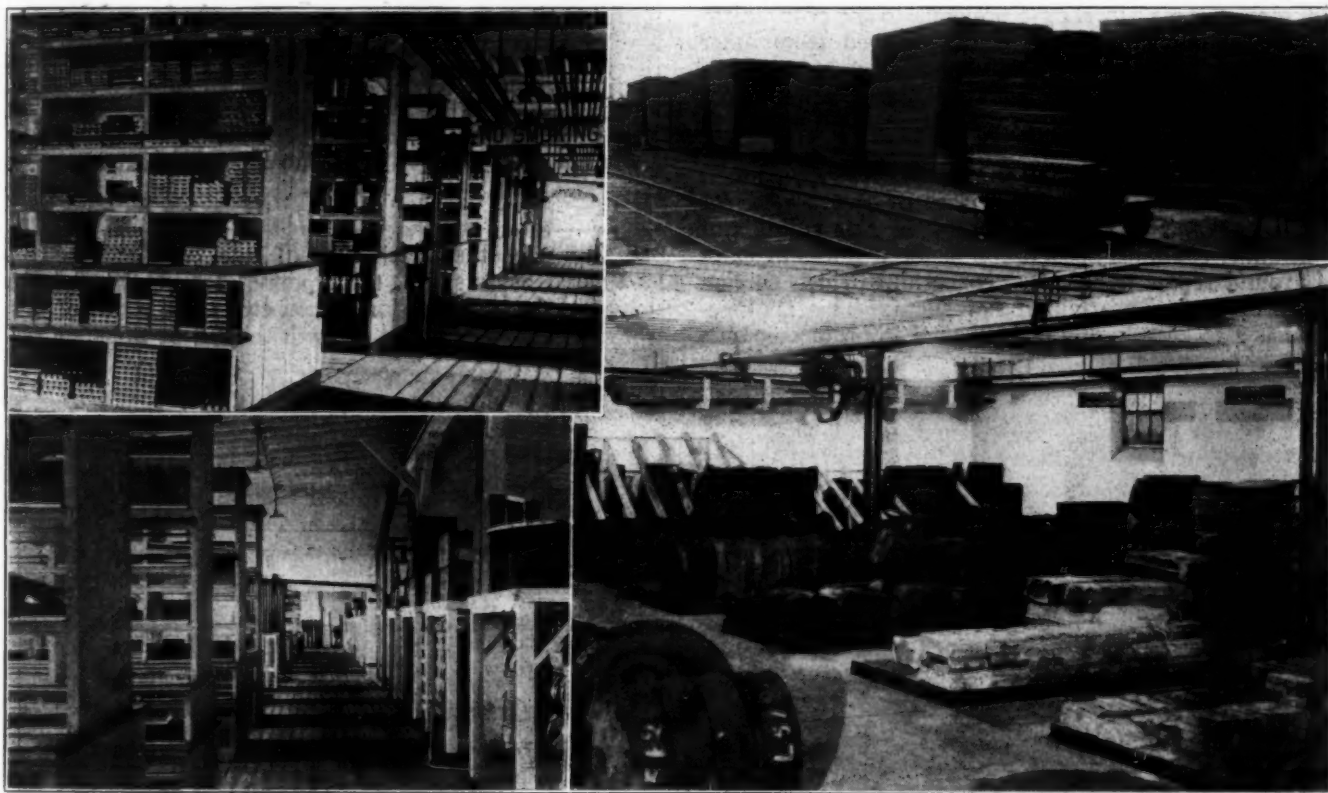
This uniformity is aided materially by the similarity in the construction of all the large storehouses which are two-story brick buildings 50 ft. wide and from 100 ft. to 600 ft. long, with basement and concrete storage platforms, thus affording three floors, which are reached by

elevators. The construction of the basements, which are all floored with concrete, was adopted several years ago on the ground that where a two-story building must be built, and is to have the lower floor at car door height and elevators for communication between floors, a full basement can be built with no additional roof cost and only slight increase in foundation cost; at the same time it will provide additional storage room of a type where the weight of the material may be disregarded. The conditions are also more favorable to the storage of hose and other supplies calling for cool and moist air. The new storehouses were all built in this manner, bringing the total number of two-story buildings to 12, out of a total of 33 store points on the system.

That the investments and expenditures made in stores improvements in the four years ending 1924 on the Northern Pacific were not incurred without gain is evident. The accompanying charts and tables invite study in this connection as well as for the general view afforded

reached pre-war levels after decreasing over a period of three or more years.

While the volume of stock on hand at the close of the year has continued sufficiently large to point plainly to the direction in which departmental efforts are being directed at present, it is noticed that the trend in this material is also downward; this was under circumstances, moreover, (chiefly a decline in consumption in the face of definite commitments for material) where without close watch on conditions, bunker stocks might easily be expected to swell. The 1924 store materials balance of approximately \$8,000,000 was \$2,000,000 less than in the preceding year, with prospects from late reports that the average was less during 1925. Bunker stocks at Como alone declined from approximately \$1,045,442 in 1921 to \$600,000 in 1925. These and other reductions in the reserve stocks, as well as a \$200,000 reduction in the payroll of the store department in 1924, are considered significant, notwithstanding that the period was char-



Upper Left—The First Floor of the Brainerd Store, Which Was Revamped. Upper Right—The New Dry Kilns Have Made it Unnecessary to Continue This Stock of Lumber at Como, Minn. Lower Left—The Second Floor of the Brainerd Store Lower Right—In the Basement of the South Tacoma, Wash., Store

of this road's material and supply conditions in recent years. The outstanding feature of the charts is a trend of annual purchases notably free from the disturbances to be expected from the fluctuations in prices since the war and from uncertain traffic conditions on a road like the Northern Pacific which must anticipate and receive much of its supplies well in advance, owing to the effect of seasonal changes on delivery. Annual purchases followed annual disbursements with a marked regularity. The most significant disclosures of the charts and tables, however, are that, quite independently of the condition of bunker or reserve stock, the annual purchases of store stocks, as well as total supplies, were less in volume at the close of 1924 (and also 1925 as late reports indicate) than in 1916 and 1917 and also that the ratio of these purchases to revenue, traffic and operating expenses, had

acterized by decreased revenues and declines in the amount of material disbursed and handled. The payroll of the purchasing and store department from 1920 to 1925 was as follows:—

	Men	Payroll
1920.....	900	\$1,216,630
1921.....	823	1,251,822
1922.....	791	1,110,398
1923.....	863	1,207,606
1924.....	734	999,279
1925.....	675	933,231

Specific instances afford some of the best indications of the merit in the improvements which have been made. In this connection attention is directed to the following random report taken from the minutes of a last year's business meeting of stores officers (now an established

institution on this road) with reference to improvements made in the car shops at Duluth, Minn.

"Since standard racks have been installed we have been able to get an accurate count of all the material in them which has enabled us to reduce the stock by 25 per cent." This is the net result of outright reductions of from 43 to 63 per cent in some classes of materials carried, offset by increases in inventory of other classes of material attendant, in numerous cases, upon the discovery of material which, because of faulty storage, had been incorrectly checked before or completely overlooked. "As an example," quoting from the report "the February records showed 50-1¼ in. union gaskets on hand and 50 ordered, while when moving the material to the new racks we found 500 gaskets that had been forgotten."

One benefit from the improvement, the importance of which deserves emphasis, notwithstanding its relatively intangible character, is the more correct accounting that has resulted from the establishment of uniformity among the classifications into which material was segregated. With almost every storehouse previous to the reorganization following classifications which differed from other stores, a confusion prevailed which was reflected in material charges. The change cut these classifications from 400 to 500 down to 50.

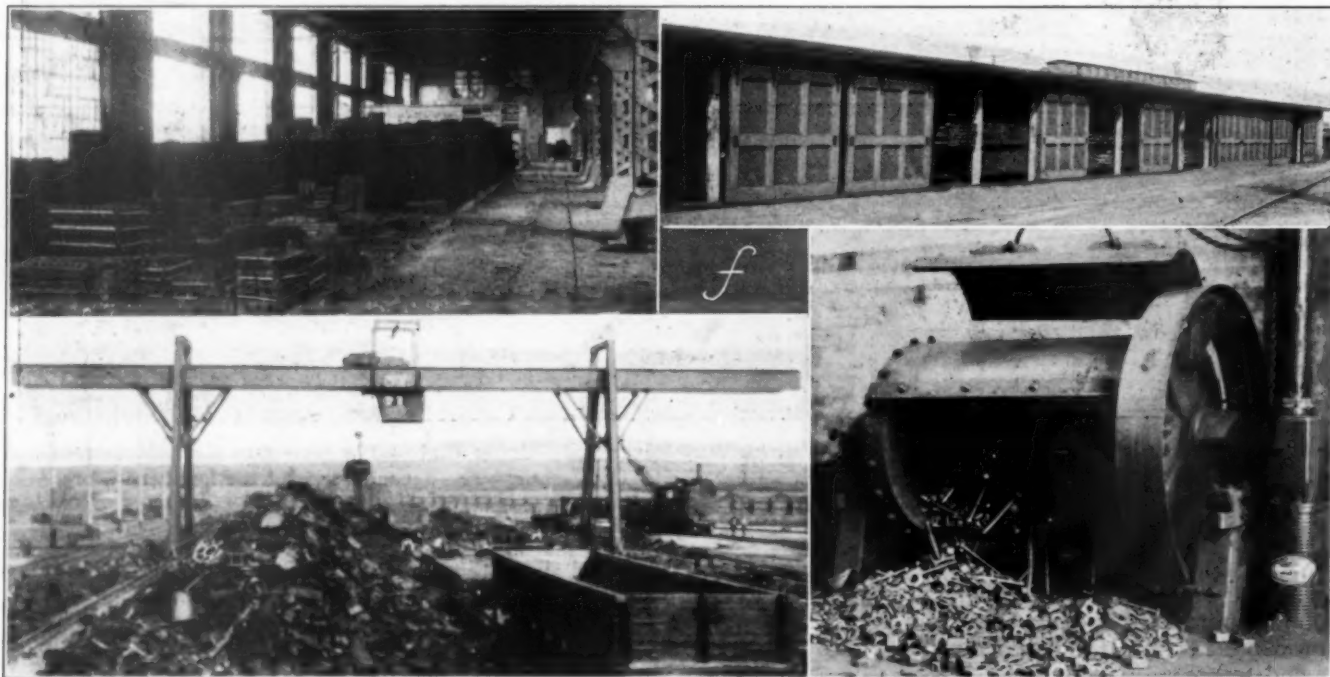
On the Northern Pacific much importance is also attached to the establishment of the practice of reporting all unapplied material of whatever class or location on the store balance. The immediate result of this ruling was to put under continual observation material stocks in shops and around repair tracks, etc., concerning which current inventories were uncertain if not silent. This arrangement has also been highly instrumental in promoting suc-

comprising the purchasing agent, the general storekeeper, and representatives of the mechanical, operating, engineering and executive offices. Through the period of 12 months this committee devoted one day a week to a detailed study of the stock, according to a plan under which



A Portion of the Interior of the Storehouse at South Tacoma, Wash.

one after the other, each item of stock was analyzed in its several aspects, i.e., the amount carried, the time in stock and the necessity for its use, etc. As a result of this work, which was carried on with the aid of the standard



Views at Brainerd, Minn. Upper Left—The Interior of the Foundry Building, Now Used for Reclamation and Material Storage. Upper Right—The New Flue and Iron Shed. Lower Left—The Scrap Dock after a big shipment from Line Points. Lower Right—One of the Bolt and Nut Cleaners

cess in the work of simplifying the stock and eliminating obsolete material.

Varieties of Stock Reduced 10 Per Cent

The work of standardization and simplification of stock began in 1924 under the direction of a committee of five,

stockbook, the number of items of current stock was reduced from 43,333 to 38,713 or 4,620 items less, notwithstanding the increase met in some lines of material, while obsolete material valued at \$215,000 was also eliminated. The heavier reductions of the simplification process are tabulated as follows:—

Material	Items cancelled
B and B lumber.....	533
Bolts, nuts, washers, etc.....	268
Flues.....	78
Bar iron and steel.....	175
Boiler, fire box and tank steel.....	246
Car forgings.....	647
Locomotive castings.....	551
Car castings.....	608
Brass castings.....	109
Standard locomotive appliances.....	369
Locomotive and car lumber.....	247
Locomotive, train and station supplies.....	113
Hardware.....	162
Glass, chemicals and painters' supplies.....	103

Scrap Costs Reduced

In the last five years the Northern Pacific has made photographs and motion picture films of its operations, which have been adapted for general educational and pub-

A STATEMENT OF THE CONDITION OF SUPPLIES FOR 1924 AND 1925

Material by Classes	On Hand End of 1925	Per Cent Disbursed To Total Available December 1924	December 1925
Frogs, switches and parts	235,076	27.7	23.5
Track fastenings	684,566	4.8	5.3
Track and roadway tools	71,619	11.2	18.4
Motor cars and parts	19,303	20.1	20.3
Interlocking and signal material	81,116	24.1	17.7
Telegraph and telephone material	14,644	11.6	15.5
Brick, lime, cement, stone, etc.	88,766	25.8	39.4
Lumber, bridge and building	188,635	9.8	28.3
Switch ties, treated and untreated	100,709		
Cross ties, treated	819,932		
Iron bridges, turntables, etc.	987,264	.4	
Ballast, all kinds	103,433	32.7	32.0
Rails, new	784	43.5	64.1
Rails, second hand, except scrap	229,703	6.8	10.6
Rail on rail rests	636,932	10.9	08.3
Fuel and water station material	92,157		
Elevators and coal handling machinery	35,050	20.4	23.5
Steam derricks, steam shovels, etc.	17,346	32.3	12.7
Chemicals for timber treatment	15,374	12.8	23.9
Chemicals for timber treatment	29,928		
Total-Maint. of w. and s.	4,432,347	7.5	7.8
Bolts, nuts, washers, etc.	264,631	4.1	20.9
Springs for locomotives and cars	71,617		4.1
Flues	260,527	6.1	
Arch brick for locomotives	4,884	40.5	70.1
Tubing and brass, copper, etc.	39,741		2.7
Bar iron and steel	232,059	10.7	17.3
Boiler, firebox and tank steel	46,837	1.8	24.0
Forgings and pressed steel, locos.	59,292	14.2	11.2
Car forgings	130,643	24.8	41.1
Locomotive castings	214,301	12.0	3.3
Car castings	560,103	18.2	21.1
Brass castings and bearings	210,182	11.8	23.6
Air brake material, all kinds	123,780	23.1	5.0
Standard appliances for locos.	44,443	13.6	4.9
Special appliances for locos.	50,771	8.4	32.3
Passenger car trimmings	79,684		14.6
Electric material, locos.	20,436	27.6	7.7
Other electric material	61,658	17.5	20.4
Shop fuel	18,794	39.6	58.2
Wheels, tires and axles	579,675	4.1	18.5
Lumber, locomotive and car	633,298	8.2	9.5
Machinery and repair parts	40,866	17.6	53.9
Boilers, fire boxes, tenders and frames	18,530	22.1	
Material in process of manufacture	102,895		20.5
Total-Maintenance of equipment	3,891,141	10.3	17.2
Loco., train and station supplies	137,487	11.6	17.1
Grain doors	107,596	26.4	10.9
Oil house material	145,291	26.4	25.0
Ice and packing for ice houses	29,515	11.5	13.9
Fuel for locomotives	794,361	46.9	50.4
Fuel for stations and cars	8,263	71.6	59.4
Commissary supplies	137,668	41.0	36.9
Total-Conducting transportation	1,360,174	41.4	42.0
Pipe, and fittings	58,725	17.1	28.1
Hardware	58,756	12.2	16.1
Hand and small machine tools	36,585	18.6	20.0
Rubber and leather goods	54,466	10.3	26.9
Glass, chemicals and paint	114,963	21.6	21.4
Stationery and printing	70,938	51.3	43.1
Power plant equipment	7,166	5.6	26.1
Scrap, all kinds	225,704	13.0	
Total-Common to all departments	627,307	20.7	15.5
Grand Total	10,935,207	16.3	17.5

lic relations work. A feature of these films is the work done in reclamation and scrap handling. With the additions made in the last two years there are now two reclamation and scrap handling plants on this road, one at South Tacoma, Wash., and the other at Brainerd, Minn. South Tacoma has been a reclamation and scrap handling point over a considerable period and operates a rolling

mill where 200 tons of scrap per month are rolled into bar iron, much of which (50 tons in some months) is subsequently converted into bolts at the reclamation plant.

The principal advance in reclamation activities, however, was made at Brainerd, Minn., one of the main shop points of the road, where one end of a commodious and well-lighted structure (built for foundry operations which were discontinued after the war as unprofitable) has been equipped with reclamation machinery—all new—and where a modern scrap dock has been provided. The reclamation work includes the manufacture of new bolts from old, the straightening of track spikes, together with the repair of nuts, shovels, scuffle hoes, wrenches, spark plugs, etc. The scrap dock occupies a strip of ground 400 ft. long, served by a traveling gantry crane having a 75-ft. span with an overhang at each end and equipped with a 15-ton hoist for operating a magnet. During 1924, before the crane was installed, the cost of unloading, sorting and reloading 18,000 tons of scrap at Brainerd was \$1.70 per ton, while studies made during the first five months of 1925, when 6,952 tons of scrap were handled with the gantry crane, showed a cost of \$1.39 per ton, a reduction of 31 cents a ton, which, on the basis of 1,500 tons per month represents an annual saving of \$5,500, or a substantial part of the cost of the new facility, aside from such additional benefits as the more expeditious release of cars. Supplementing the reclamation facilities at South Tacoma and Brainerd, the Northern Pacific also maintains an oil and waste reclamation plant at Duluth, which also produces substantial returns of the investment.

Supply Train Equipped With Crane

The supply train is an established institution on this road for delivering material to maintenance of way forces over the line, for one of the first supply trains operated was on this road. The Northern Pacific inaugurated supply train service in 1920. There is, all told, enough equipment for three trains, which operate over the main lines on a 60-day basis and over branch lines on a 120-day basis, during which they deliver all supplies for sections and stations, including tools, oil, switch ties, etc., and gather all scrap, stopping between stations where necessary. These trains are invariably accompanied by system or division officers, thus also serving the purpose of an inspection train. They include in the regular equipment a locomotive crane operating a magnet with which to pick up second hand rail and scrap of all kinds and also to assist in the distribution of rail, frogs, switches and various other heavy metal material, etc. A report on the cost of operating these trains compiled in April, 1925, shows that during a period of 63 working days the cost of operating the train over 6,973 miles of line was \$8,612, or at the rate of \$1.23 per mile. During this period supplies valued at \$138,000 were delivered and \$16,000 worth of scrap and second hand material stocks picked up.

General Storekeeper Travels Extensively

It is the consistent practice of the general storekeeper of this road in late years to visit every storehouse on the system every 60 days, notwithstanding the fact that it takes a minimum of 20 days to complete such a trip. It is significant that for these and other purposes this officer was on the line of the Northern Pacific 116 days in the 11 months ended December, 1925, during which time he traveled 26,000 miles. In justification of this practice the claim is made that advantages are derived by personal supervision on the ground and by the acquaintances established between men and with local problems which, on a property as extensive as the Northern Pacific, more than offsets the disadvantages of extended absences from headquarters.

British Columbia Grants Land to Pacific Great Eastern

THE British Columbia legislature has passed the Pacific Great Eastern Railway Land Grant Act which provides that four blocks of land containing approximately 16,000,000 acres and valued at \$80,000,000 be transferred to the Pacific Great Eastern to enable the government to negotiate its sale. The act was passed to aid in the construction of the Pacific Great Eastern from Vancouver to a point on the Canadian National near Prince George and for an extension from the latter point to Pouce Coupe and is not to exceed 20,000 acres for each mile of the main line of the railway now completed or to be built.

All lands included in this grant are to be exempt from taxation for a period of 20 years from the date of the grant. All rentals and fees accruing from precious or base minerals including coal, petroleum and natural gas contained in the lands granted which are payable to the Crown under any act relating to the acquisition of minerals from the Crown shall, when collected, be paid to the Pacific Great Eastern.

Four blocks are included in the grant. The Cariboo block, containing an area of 2,845,000 acres, is situated in the Cariboo and Lillooet land district. The West Cariboo block, containing 3,750,000 acres, is located in the Cariboo land district. The West Lillooet block, containing 3,040,000 acres, is located in the Lillooet land district. The Peace River block, containing 6,440,000 acres, lies in the Cariboo and Peace River districts.

In 1922 three experts were engaged to investigate the Pacific Great Eastern and to determine its present economic and its potential value. One of the investigators, J. G. Sullivan, consulting engineer at Winnipeg, Man., and formerly chief engineer of the Canadian Pacific, Western Lines, stated that if the people of British Columbia were not prepared to continue paying from \$2,500,000 to \$3,000,000 per year for the next ten years on the investment already made, the road should be abandoned at once. W. P. Hinton, another investigator, and a former general manager of the Grand Trunk Pacific, had little to say in favor of continued operation. and J. S. Dennis, director of colonization of the Canadian Pacific, stated that the railroad in question could not be expected to pay operating costs for many years.

Contrary to the advice of these men the Province of British Columbia decided to continue the operation of the railroad from Squamish, B. C., to Quesnel, a distance of 348 miles, and to proceed with a program of extensions and betterments. John Oliver, Minister of Railways of that province, declared that the railroad would not be abandoned and that work would be carried on for another year in order that the taxpayers' investment of \$40,000,000 should not be wholly lost.

In 1912 the Province of British Columbia guaranteed securities to the extent of \$35,000 per mile for 450 miles of line. In 1914 this guarantee was extended over the entire 480 miles, and additional securities to the extent of \$7,000 per mile were guaranteed, making a total of \$42,000 per mile for 480 miles, amounting to \$20,160,000.

By acts of the Legislative Assembly of the Province of British Columbia advances in the form of loans totaling \$19,443,957 have been made to the company. Under an agreement dated February 22, 1918, the government of British Columbia acquired all the capital stock that was not then owned by it.

The rolling stock of the Pacific Great Eastern consists of 12 oil-burning locomotives, 2 gas-electric cars and 2 gas-motor cars, operating out of North Vancouver;

there are 26 passenger cars and 241 freight cars.

The funded debt amounts to \$44,221,822, and the accrued interest \$3,548,806. The investment in road and equipment is \$46,302,061. In 1924 the company was operated at a deficit of \$2,551,120 as compared with \$2,435,935 in 1923 and \$2,452,883 in 1922. The passenger earnings for these three years were respectively \$106,808, \$115,920 and \$99,256. The freight earnings during the same years were \$213,322, \$287,272, and \$237,393 while other earnings were \$89,883, \$32,857, and \$95,422. The gross earnings were \$410,013, \$436,049 and \$432,071 while the operating expenses were \$680,856, \$660,514 and \$821,111, leaving operating deficits of \$270,843, \$224,465 and \$389,040 which with other income amounting to \$20,229, \$15,328 and \$451 left deficits in the total income of \$250,614, \$209,137 and \$388,589. With fixed charges amounting to \$2,300,506, \$2,226,798 and \$2,064,295 the deficit for each year was \$2,551,120, \$2,435,935 and \$2,452,883.

In an address made recently before the Vancouver Board of Trade, Premier Oliver said, "There has been invested in the railway up to the end of June, 1925, more than \$47,000,000 while interest charges paid up to that time were more than \$17,000,000. During the past seven years there have been aggregate losses of more than \$2,000,000 or an average of more than \$295,000 per annum. A total of 360 miles of railway are in operation, while 112 miles are still to be completed to unite North Vancouver with Prince George. To fill in the gaps will require \$4,500,000 additional capital. Development in the country served by the road has been slow and the resources of the district are largely unknown.

"Connecting the Pacific Great Eastern with the Edmonton, Dunvegan & British Columbia is the desired objective in the solution of the problem and a study of conditions as they exist and an examination of the country show that the logical route to be followed is by way of Peace Pass rather than Pine Pass. The elevation of Peace Pass is 1,300 ft. lower and by constructing through the Peace Pass and on to Finlay Forks, the most strategical point in the future development of British Columbia's northern country would be reached."

A Malleable Iron Which Can Be Galvanized

THE Ohio Brass Company, Mansfield, Ohio, has developed a new metal which it has called Flecto iron. This is a type of malleable iron which, by virtue of a heat treating process, is freed from all tendency to become brittle when hot-dip galvanized. It is said to retain all of the desirable characteristics of malleable iron. All malleable iron castings produced by this manufacturer during the past two years have been treated by this process, but the announcement was withheld until the metallurgy of the metal had been thoroughly proved by its use in the field.

Hot-dip galvanizing has long been recognized as the best method of rust-proofing castings. However, ordinary malleable castings are frequently embrittled by galvanizing. As a result, many substitute methods of rust-proofing have been resorted to, but experience has shown the great desirability of hot-dip galvanizing if the bad effect upon the iron could be overcome. This has now been accomplished in this iron, whose main characteristic is that it always retains its malleable properties. All the castings manufactured by this company are treated by this process, whether hot-dip galvanized or not.

C. E. Schaff to Retire

C. N. Whitehead, executive vice-president, expected to succeed him as president of Missouri-Kansas-Texas

CHARLES E. SCHAFF, president of the Missouri-Kansas-Texas, will retire on May 1, according to an announcement made at the close of a meeting of the board of directors in New York on February 15. Mr. Schaff has been president or receiver of the Missouri-Kansas-Texas since April 15, 1912. The statement of the board of directors indicated that Charles N. Whitehead, executive vice-president, will succeed Mr. Schaff as president, although the board did not act officially upon the selection of a new president.

Mr. Schaff's age, 70 years, and his long railway career which has extended over a period of 55 years, were given as the reasons for his retirement. Mr. Schaff has seen the Katy, under his administration, become firmly established as a property of high earning power, operating with great efficiency. This is considered to have been a factor in Mr. Schaff's willingness and desire to step down at this time and give the reins to a younger man.

Interest has recently been centered on the Katy because of the purchase by the Kansas City Southern of an interest in it amounting to more than 250,000 of the 1,049,414 outstanding shares of Katy stock. Following this purchase, four directors representing the Kansas City Southern and other Loree interests, were elected to the board of the Katy, indicating that it will inevitably be an important part of the projected Loree system in the Southwest. What effect this possession of an interest in the Katy by the Kansas City Southern will have on the corporate existence of the former is a matter of conjecture.

Earnings Improve

Since its reorganization, which took effect on April 1, 1923, ending a receivership of approximately eight years, the earnings of the Katy have shown a steady increase. In 1925, it earned a balance after interest on the adjustment mortgage bonds of \$6,117,619, equivalent after allowance for 7 per cent dividends on the preferred stock to \$5.41 on each share of common stock. The balance after interest in 1924 was \$5,508,438; equivalent to \$4.72 a share on the common, and in 1923 it was \$2,413,699, which was equivalent to but \$1.20 a share. Interest has been paid on the adjustment mortgage bonds since April, 1923. In February, 1925, preferred dividends were initiated at a rate of 5 per cent. The preferred stock will be entitled to 7 per cent cumulative dividends after

January 1, 1928. No dividends have as yet been paid on the common stock.

The Katy continued into 1925 the progress which it has been showing in recent years. For the year its total operating revenues were \$57,492,914, representing an increase of \$183,569 over 1924 and of about \$1,500,000 over 1923. Operating expenses in 1925 were \$39,618,128, showing a decrease—in spite of the increased traffic—of \$113,906 under the figure for 1924 and of about \$4,000,000 under 1923. Net railway operating income

or net after equipment and joint facility rents and before the deduction of interest and other charges was \$12,825,624 in 1925 as against \$11,587,498, in 1924, this representing an increase for 1925 of \$1,238,126 or about 11 per cent. In the Southwestern region as a whole, the net operating income in 1925 exceeded that for 1924 by only 3½ per cent.

Rehabilitation Program

The outstanding achievement of Mr. Schaff's administration of the Katy, aside from its improved earnings, has been the rehabilitation of its physical condition. Mr. Schaff became president in April, 1912. The railway was then a typical southwestern granger road in physical condition and in traffic. It was built with grades conforming to the general surface of the territory served, with narrow banks and cuts and rails of light section and varying weights.

Its tracks and bridges were not strong enough to accommodate locomotives of modern size and weight. Most of its locomotives were light and of old design and it lacked good engine terminals and shops for handling and maintaining its power. These conditions rendered it impracticable to move freight in large train loads and with economy. Various parts of the property had been built at different times by construction companies, largely for speculative purposes. It had been loaded with heavy fixed charges upon an indebtedness taking a wide variety of forms. Its high operating costs and fixed charges had rendered it impracticable to raise the new capital required to make the permanent improvements without which operating economies could not be effected.

The years 1914 and 1915 were a period of reduced traffic and poor earnings for all of the railways of the country, including those of the Southwest. Led by Mr. Schaff, the new management of the Missouri, Kansas & Texas, in addition to discontinuing the payment of divi-



C. E. Schaff

dends on its preferred stock, effected some reductions in operating expenses, especially in transportation expenses. But in September, 1915, the company was unable to pay interest on an issue of two-year notes and the property was placed in the hands of a receiver, to which position Mr. Schaff was appointed.

Immediately after Mr. Schaff took charge of the Katy in 1912, the formulation of plans for needed improvements was begun, but until the receivership it was impossible to make progress in carrying them out. The receivership removed the necessity of meeting all fixed charges and made it possible to begin carrying out a real improvement program. The change in policy was reflected immediately in a large increase in expenditures for maintenance. Before 1916 these expenditures had not in any year exceeded \$10,000,000. In 1916 total expenditures for maintenance were increased to \$14,909,499. The expenditures chargeable to capital account made under the receivership from September 27, 1915, to December 31, 1920, were \$25,556,283. The interest not paid was almost the same, being \$24,000,000. Of the total expenditures charged to capital account, \$11,109,965 was for equipment, and \$14,446,318 for roadway and other permanent structures.

The effect of these expenditures was apparent immediately. By 1920, 1,197 miles of the Katy had been improved and strengthened by widening banks and cuts, 355 miles of the line had been newly ballasted, and 970 miles were re-ballasted. The average weight of rail was increased from 67.56 lb., as of December 31, 1912, to 73.85 lb. on September 30, 1920. In all, 1,162 miles of heavy rail had replaced light rail over the Katy system. Similarly, many trestle bridges were replaced with permanent structures, terminal facilities were greatly expanded and the supply of rolling stock was greatly augmented.

The effect of this rehabilitation was soon apparent in the operating results and costs. In 1923 the Katy had a ratio of transportation expenses to total operating revenues of 32.83, the lowest reported in at least a ten-year period. In 1924 the transportation ratio was reduced to 31; in 1925 there was further improvement in spite of increased prices for fuel oil so that the transportation ratio was cut 30.6; excluding the M-K-T of Texas the 1925 transportation ratio was only 25.5. The results of the rehabilitation program and Mr. Schaff's campaign for greater efficiency began to show in 1920 and on the Texas lines in particular in 1921. The most remarkable change was notable in connection with the train loadings and motive power utilization. In 1924 as compared with 1920 the Katy moved 32 per cent more cars per train, thereby effecting an increase of 33 per cent in the gross tons per train and of 30 per cent in net tons. Furthermore, it moved its trains faster, so that the increased loading was not accomplished at the expense of train speed. The train speed, or miles-per-train-hour in 1920, was 10.9, but in 1924 no less than 12.4. As a result of these factors, net ton-miles per train hour increased 48 per cent in the four years from 1920 to 1924, being 6,354 in the former year and 9,388 in the latter year. Net ton-miles-per-train-hour on the lines in Texas showed an even greater increase in this period, the increase being approximately 55 per cent. The complete operating statistics which will be available shortly will probably reflect additional improvement.

In addition to the results he secured in improving the physical condition of the Katy, Mr. Schaff has built up an official organization of ability and has secured to a marked degree the wholehearted co-operation of the Katy's employees. There is good feeling and close co-operation between the various branches of the operating depart-

ment. The policy inaugurated by the management several years ago of inviting the chairmen of the grievance committees of the labor organizations to participate in staff meetings and serve on efficiency committees at various times with the officers, has been very effective in creating a cordial and helpful spirit between the management and the employees and it probably has served directly to increase the efficiency of operation. Mr. Schaff will leave the Katy with the knowledge that his years of administration have put it definitely upon its feet.

Career of Mr. Schaff

Mr. Schaff was born on February 4, 1856, in Licking county, Ohio, and entered railway service in January, 1871, as a brakeman on the Pittsburgh, Cincinnati & St. Louis, now a part of the Pennsylvania. He was later employed in various capacities, including those of fireman, baggageman, conductor, yardmaster, trainmaster and general superintendent on that road and on a number of others including the Cleveland, Cincinnati, Chicago & St. Louis. After serving for some time as general superintendent of the Peoria & Pekin Union, Mr. Schaff was appointed assistant to the president of the Big Four in July, 1893. He was promoted to assistant general manager in September, 1894, and was promoted to general manager in November, 1895. His success on the Big Four led to his election as vice-president of the New York Central Lines at Chicago in June, 1906, and he remained in that position for six years. In April, 1912, he was elected to the presidency of the Missouri-Kansas-Texas. During the receivership, from September, 1915, until April, 1923, he served as receiver for the property while retaining his position as president of the corporation. Subsequent to the reorganization Mr. Schaff was elected president of the new company and he has continued in that position up to the present time.

Five Years' Savings on the Baltimore & Ohio

C. W. GALLOWAY, vice-president of the Baltimore & Ohio, in his address at the last meeting of the Atlantic State Shippers' Advisory Board in New York City, gave a number of interesting items in the record of remarkable savings which have been made in the operation of that road during the past few years by increased efficiency in management.

Definite plans for increasing the freight train load were begun 15 years ago, and in that time the net train load has been increased from 442 tons to 873 tons; an increase of 98 per cent; and this was accomplished by an increase of only 31 per cent in the total traction power of the company's freight locomotives. The freight movement of 1924, would have required, under the methods in force 15 years before, 4,000,000 more freight train miles, which would have meant an out-of-pocket cost of approximately \$5,000,000.

When the larger locomotives were put in use, there was a question what to do with the lighter engines displaced, and on the company's southwestern line, where, to prepare the road for heavy locomotives would have required an expenditure of \$5,000,000 for new bridges, the light locomotives were improved and modernized at a cost of only about \$3,000 each; and thereby \$405,000 was saved. This, however, did not take all of the locomotives that had been displaced and 96 of them have been remodeled for use in switching. Two of these engines do the work formerly done by three switchers, so

that 96 yard engines in 20 months have produced a saving which amounts to \$703,000 per year.

Study of fuel conservation (which involved the appointment of a specialist on each division) has reduced the fuel expenditure in 1925 as compared with 1924, by the sum of \$527,202, not taking account of any difference in the price of the coal; and this fuel efficiency organization costs only \$40,000 a year.

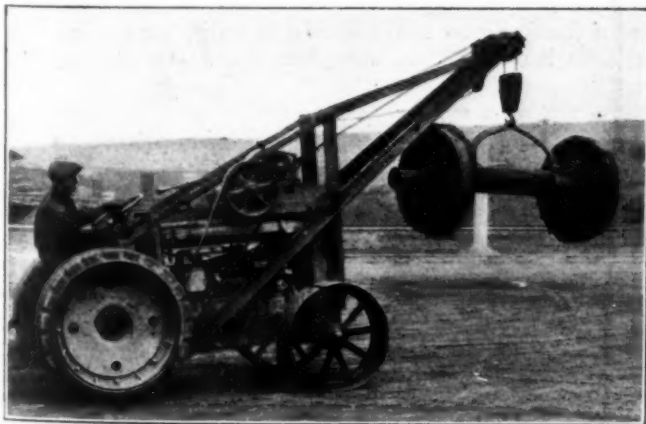
Avoidance of unnecessary stoppage of freight trains in yards has produced marked economies, and some freight trains now run through six or more yards without leaving the main track; and at the present time 32 per cent of all the company's freight trains are "main-trackers." The saving in yard expense on this account, since 1921, has totaled \$4,773,546. The same specialist who supervised this improvement next tackled the operation of pushing engines on mountain grades; and within about five years \$9,084,011 has been saved in that service.

Trimming of coal on ships loaded at Baltimore was another heavy expense, 800 men being required; and because of the war the wages of these trimmers were very high. Finally, Mr. Galloway got his engineers to tackle the problem and he built a trimming machine at a cost of \$40,000. This was when he was federal manager; but the success was so great that since the road came out from under control of the government, \$145,000 more has been spent. These machines have trimmed 5,452,102 tons of coal; and the saving over hand-trimming has amounted to \$1,269,706, or about 23 cents a ton.

Mr. Galloway referred briefly to the success of what had been done to improve the relations between the officers of the company and the employees, especially in the shops, where the employees, acting on their own initiative have chosen committees to co-operate in efficiency.

Rix Fordson Industrial Hoist

THE hoisting unit shown in the illustrations is adapted to hoisting, loading and stacking stores material at store rooms, carrying materials from store rooms to locomotive shops and enginehouses, carrying the loads on the hoist boom or loading trailers and

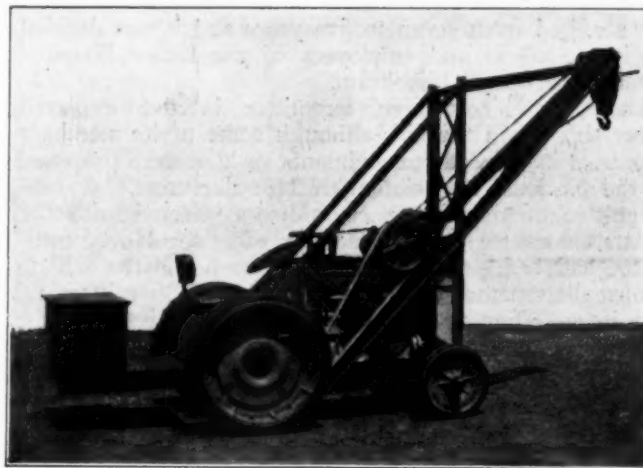


Lifting and Carrying a Pair of Car Wheels

pulling the trailers to their destination and then unloading them. It is known as the Rix Fordson hoist and has been placed on the market by the Squier-Rix Company, 373 Broadway, Milwaukee, Wis. Simplicity of construction characterizes this hoist. It is designed to fit on the Fordson tractor without the necessity of drilling holes or in any way altering the mechanical construction of the tractor.

The boom structure is of a rigid bridge construction designed to take care of swinging load stresses which occur when the equipment is moving suspended loads. The boom elevating mechanism is of the regular double pulley and cable type. It is equipped with an 8-in. by 8-in. drum which will hold 100 ft. of 5/16-in. cable. The regular equipment includes 45 ft. of 5/16-in. flexible cable.

An automatic load brake which is standard on electric cranes is incorporated in the hoisting mechanism. This brake engages the load instantly when the power is re-



The Hoist, with Loaded Ballast Box and Wheels, Has a Capacity of 3,000 lb.

leased, preventing any possibility of the load dropping.

A limit switch is incorporated in the mechanism to prevent over-hoisting. The purpose of this device in a short lift portable hoisting unit is to insure the equipment and property against the forgetfulness of the operator in handling the control lever. This switch automatically throws out the control when the load is raised to the maximum height. An 18-in. by 18-in. by 2-ft. 9-in. ballast box is placed on the rear frame to add to the carrying capacity of the hoist. If not used for this purpose, it will serve as a tool box. The capacity of the unit is about 1,500 lb. when equipped with standard Fordson wheels and the loaded ballast box. The loaded ballast box, together with loaded and weighted wheels will give the unit a carrying capacity of approximately 3,000 lb. The hoisting mechanism itself is designed and built for a maximum capacity of two tons.

This hoist is operated by means of one lever conveniently located near the operator's seat. It is built with lifts of 5 ft., 8 ft., 10 ft., and 14 ft., which gives a wide range of lifting heights for various services. The hook travel of the hoist is 23 ft. per minute. Ten horsepower of the capacity of the Fordson tractor is required to hoist and lower the maximum load.

THE NEW ENGLAND SHIPPERS' ADVISORY BOARD held its second regular meeting at Portland, Me., on January 29 and 30, with an attendance of nearly 400. All of the 60 commodity committees made reports, which were uniformly optimistic. G. C. Randall represented the car service division of the American Railway Association. Other speakers were H. F. Merrill, chairman of the directors of the Port of Portland; A. G. Staples, editor of the Lewiston Journal and Percy R. Todd, president of the Bangor & Aroostook. Governor Ralph O. Brewster addressed the meeting on the co-ordination of agriculture, manufacturing and transportation. He said that agriculture is now being intensively developed in New England.

Labor Bill to Be Reported

WASHINGTON, D. C.

CHAIRMAN PARKER of the House committee on interstate and foreign commerce has announced the intention of reporting the railroad labor bill, substantially in the form it was agreed upon by representatives of the railways and of the unions, to the House on February 19, although the committee has adopted verbal amendments to some of the administrative provisions of the bill which do not affect the spirit of the agreement. The term of office of members of the board of mediation was changed from seven to five years and it was decided to give members and employees of the Labor Board a month's pay upon its abolition.

The Senate commerce committee is also expected to act shortly on the bill, although some of its members have been insisting on amendments such as were proposed by the National Association of Manufacturers. A subcommittee of the House committee conferred with the Senate committee on February 15, after the House committee had had several executive sessions on the bill, to inform the senators of the intention of the committee and also in an effort to have the bill reported in the same language if possible in both houses to avoid delay. On February 17 the House committee conferred with Alfred P. Thom, general counsel of the Association of Railway Executives, and Donald R. Richberg, counsel for the railway labor organizations, in executive session, regarding the proposed amendments. An erroneous report was published in the newspapers that the Senate committee had approved the bill on Monday. No action was taken by the committee at that time, although a majority of the members are believed to favor the bill.

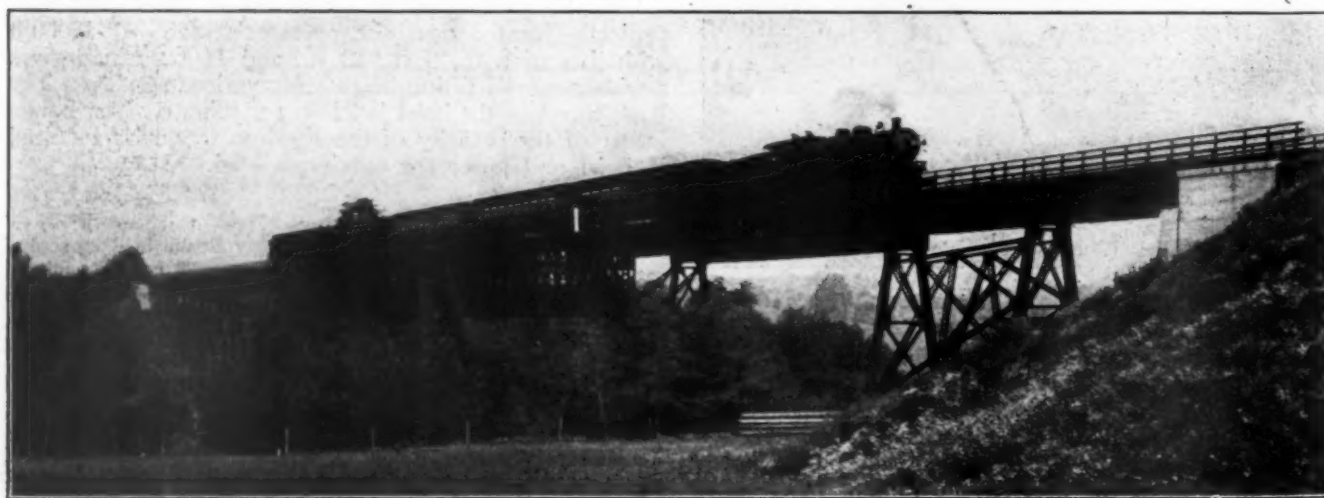
In his concluding statement before the House committee on February 10 Mr. Thom asked that theoretical criticisms of the bill be disregarded and that it be considered from the practical standpoint. The railways are faced with present and prospective demands for wage increases which have been estimated at something like \$500,000,000 a year, he said, and there is no machinery for dealing with the situation except a board that has been repudiated by the organizations and is powerless. The railway managers are not unmindful of their responsibility to the public nor of the public interest, he said, and they say that this is a plan that should prevent strikes and promote peace. If the plan proposed by the bill should

go no farther than to carry the country through the situation to be created by these wage demands it would have been well worth the time and attention given to it.

We are faced, Mr. Thom said, with the question whether to take the path that leads to compulsion or that which leads to agreement. If the path of compulsion is chosen the compulsion must be effective. It will not do to alienate the labor organizations unless force enough is provided to make the plan effective and he thought Congress is not yet ready to adopt a plan of force; therefore it should not destroy the prospects of peace held out by the plan proposed in the bill by adopting suggestions for amendments which are inadequate and useless. Mr. Thom referred to the proposal to increase the power of the proposed emergency commission, saying it is a proposal to protect the public interest "by giving a board power to issue a subpoena." He said he had in the conferences contended for giving the board more power, to satisfy the agitation for it, rather than for any purpose he thought it would serve. He said he had wanted everybody to be satisfied with the bill but that he was not willing to wreck the agreement to do so by giving additional power to the commission. He said he had not thought of the emergency commission as a mediator, as suggested by Mr. Richberg and Mr. Easley, but that it might attempt to mediate. He assumed that it would be composed of men of the highest intelligence who would do whatever could be done to adjust the controversy and he thought it would be very hurtful to attempt to define the duties of the commission closely by law. In reply to suggestions that the Interstate Commerce Commission be given a power to review wage agreements Mr. Thom said the commission would not last a year under such conditions.

At the conclusion of the hearing Representative Barkley, who introduced the Howell-Barkley bill in the House at the last session of Congress, said that he had been a member of the committee on interstate commerce for 14 years and that he thought that in all that time no hearing had ever been conducted before it with greater ability or with greater courtesy and broader consideration of the public interest on both sides than this one; also that there had never been a long hearing which had been so well attended by members of the committee.

Chairman Parker of the committee said that invitations had been sent to Chairman Hooper and W. L. McMenimen of the Railroad Labor Board to testify on the bill but that both had replied by wire that they could not appear.



Cattaraugus Viaduct, Cascade Park, N. Y., on the B. R. & P.

Chicago, Milwaukee & St. Paul Investigation

THE hearing in the investigation of the receivership of the Chicago, Milwaukee & St. Paul before the Interstate Commerce Commission, which was resumed in Chicago on February 8, was adjourned on February 16 and moved to St. Louis, Mo., for a one-day session on February 17. This was done to gather further information concerning the purchase of the Chicago, Milwaukee & Gary, which was arranged in St. Louis. The St. Paul is nearing the completion of its testimony and after the St. Louis hearing a recess will be taken. The outstanding revelation at Chicago was the statement of W. W. K. Sparrow, chief financial and accounting officer of the St. Paul, to the effect that the Binkley Coal Company was chosen to sign the bill of complaint asking for a friendly receivership as that company was the only creditor which had a large enough amount due, whose members possessed certain citizenship requirements necessary to ask for a receivership, and whose members were known by officers of the St. Paul.

The greater part of the testimony at Chicago was presented to show that the purchase of the Chicago, Milwaukee & Gary and the leasing of the Chicago, Terre Haute & Southeastern, had proven advantageous to the St. Paul as the latter had gained access to coal fields and had reduced the cost of coal through the elimination of freight charges. This testimony dealt with the analysis of the coal from the Indiana mines and the advantages gained through the use of specific grades.

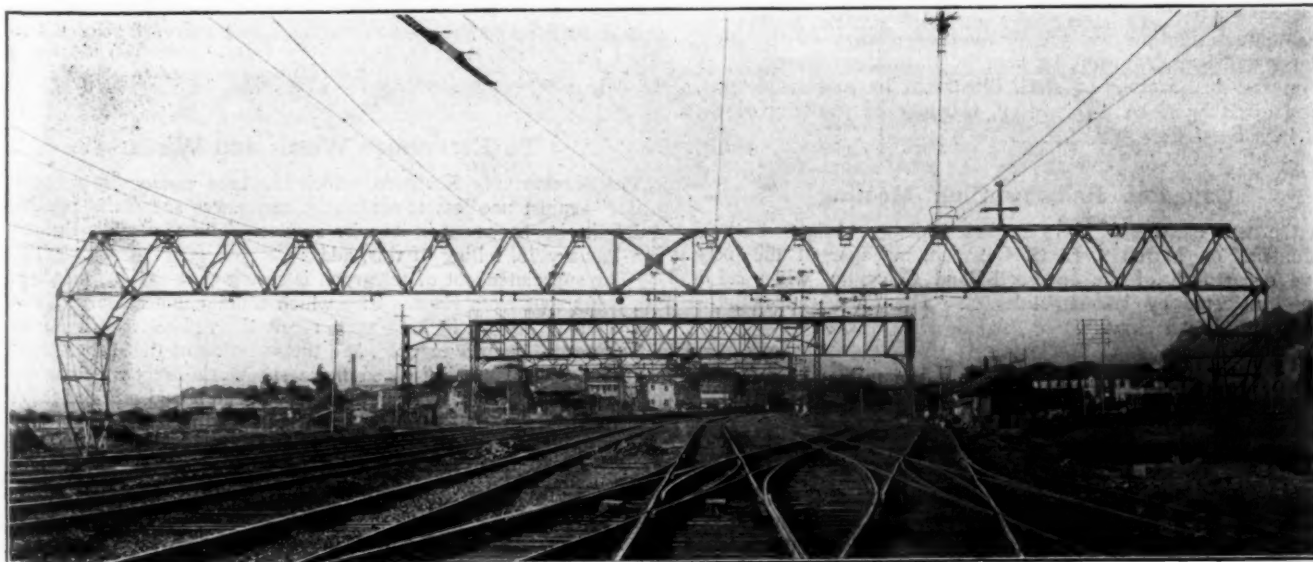
H. W. Ostrom, chief chemist of the St. Paul, presented an exhibit showing the analysis of coal from the several mines from which the railroad received its supply and described the method of procedure used in such analysis. Irving Gill and Thomas Moss, coal inspectors, explained the manner in which they inspected coal mines. L. K. Sillcox, general superintendent of motive power, compared the efficiency of locomotive operation when the different kinds and sizes of coal were used and favored uniform grades as a means of securing ideal firing conditions which would bring about efficient locomotive operation. His statement was supported by J. E. Bjork-

holm, assistant superintendent of motive power, who testified that coal from Indiana mines gave better results in locomotives than that from Illinois mines.

As a means of supplying the commission with information concerning the comparative advantages of Illinois and Indiana coal, C. E. Trotter, supervisor of fuel performance of the New York, Chicago & St. Louis, was called to the stand to present records of tests made by that road on Indiana and Illinois coal. These tests covered the actual operations in moving freight over the Nickel Plate under conditions similar to those on the St. Paul. His statistics tended to show that less coal was consumed per thousand gross ton-miles when lump coal was used than when mine run was used.

The appearance of Chicago bankers to testify relative to conditions surrounding the sale of the Chicago, Milwaukee & Gary and the leasing of the Chicago, Terre Haute & Southeastern, was postponed upon the request of F. O. Wetmore of the First National Bank of Chicago. In order to clarify previous testimony given at Washington and counteract current reports concerning the purchase of the Gary line, S. W. Fordyce denied reports that he had offered the Chicago, Milwaukee & Gary to Percy Rockefeller for \$1,000,000. He explained that he had no power to make such an offer and that he had known nothing about the sale until after it was consummated.

The bill of complaint was offered in evidence and Ralph M. Shaw, an attorney of Winston, Strawn & Shaw, who acted for the receivers, took the stand. Cross-examination was directed to prove that he served both companies and was paid by the St. Paul. The security holders' defense committee questioned him in regard to a meeting on March 15 in an effort to show the relationship of Kuhn, Loeb & Co., to the precipitation of the receivership. When Mr. Sparrow took the stand it developed that following the March 15 meeting, H. H. Field, general counsel, consulted Mr. Sparrow to determine whether there was a creditor that would meet certain requirements and who would be willing to sign a bill asking for a friendly receivership. Upon the consent of Mr. Binkley and Mr. Howard the name of the Binkley Coal Company was placed in the bill of complaint and the bill was signed.



8-Track Overhead Traction Bridge Near Bombay, India

General News Department

Clerical employees of the American Railway Express Company represented by the Brotherhood of Railway and Steamship Clerks, have requested increases in wages of 11½ to 12 cents an hour.

The Interstate Commerce Commission has modified its second automatic train control order as to the Chicago & North Western so as to postpone the effective date until July 18.

The Interstate Commerce Commission has denied the petition of the New York, New Haven & Hartford for modification of its second train control order, except insofar as to make the effective date July 18, 1926, instead of February 1.

The record of freight cars passing Gallitzin, Pa., on the Pennsylvania Railroad, for one day, February 1, shows a total of 9,698 cars (east and west), the largest figure ever recorded. The longest train eastbound was 85 cars, loaded, and the longest westbound was 115, empty.

The Chesapeake & Ohio has decided to abandon the type of train control which it has had in operation for several years in favor of the intermittent inductive type. Just what system will finally be adopted has not yet been decided upon, but a decision has been reached to abandon the ramp contact system which has been in use up to the present time. Over one million dollars has been spent by the road on the train control system which will be abandoned.

Porters and maids employed by the Pullman Company have been granted wage increase averaging 10 per cent, which will aggregate approximately \$1,000,000 annually. The increase was negotiated by the Pullman Company with a number of representatives of its employees under the company's employee representation plan. The wage increases became effective February 15. Under the new schedule the starting wage for porters will range from \$72.50 to 90.50 per month, automatically increasing as the length of service becomes greater, to a maximum of from \$83.50 to \$104 a month.

Pittsburgh Railway Club Meeting

At the next meeting of the Railway Club of Pittsburgh to be held on February 25, R. E. Woodruff, superintendent of the Erie at Buffalo, N. Y., will address the members on "Man Failures—Cause and Remedy."

Annual Meeting of New England Club

The annual meeting for the election of officers of the New England Railroad Club will be held in Boston on March 9. A talk on the manufacture of steel, illustrated by motion pictures, will be given by G. A. Richardson, manager of publicity of the Bethlehem Steel Company.

Canadian Railway Club Meeting

At the next meeting of the Canadian Railway Club, to be held in Montreal on March 9, L. G. Coleman, manager of the locomotive department of the Ingersoll-Rand Company, will read a paper, illustrated by lantern slides on "The Oil-Electric Locomotive in Railroad Service."

Chicago Section A. S. M. E. to Hold Railway Night

The regular monthly meeting of the American Society of Mechanical Engineers, Chicago Section, scheduled to be held Wednesday evening, February 24, at the rooms of the Western Society of Engineers, Monadnock Block, Chicago, will be devoted to Railway Night, the subject for discussion being the three-cylinder locomotive. "Construction and Economy" features will be presented by J. G. Blunt, mechanical engineer, American Loco-

motive Company; "Operation" by W. A. Pownall, mechanical engineer, Wabash; and "Some Test Results" by E. L. Woodward, western mechanical editor, *Railway Age*.

Cleveland Railway Club Meeting

The Cleveland Steam Railway Club will meet on March 1 to discuss Supplement No. 1 to the 1925 A. R. A. Loading Rules and the recommended changes proposed to the 1927 A. R. A. Mechanical Rules. The club will henceforth have its headquarters at the Hollenden hotel, Cleveland, Ohio.

New Bill to Reorganize I. C. C.

A new bill, S. 3120, to provide that the members of the Interstate Commerce Commission shall be appointed from different specific sections of the United States, and that not more than one member shall be appointed from any one state, has been introduced in the Senate by Senator Trammell of Florida. It provides that the commissioners shall be appointed, one each, from the New England states, the North Atlantic states, the South Atlantic states, the Gulf states, the Central Southern states, the Great Lakes states, the Central West and Southwestern states, the Northwestern states, the Pacific Coast states, the Central Interior states and one from the United States at large. The groups of states named are not defined. It is also provided that the terms of present commissioners shall not be affected, but that in filling vacancies the President shall conform to the requirements stated.

Reasons for T. & P. Strike Vote

The reason for the taking of a strike vote by train and engine service employees of the Texas & Pacific was explained to the Railway Labor Board in Chicago on February 12 by representatives of the Brotherhood of Railroad Trainmen, the Brotherhood of Locomotive Engineers, the Brotherhood of Locomotive Firemen and Enginemen, and of the managements of the Texas & Pacific and the Missouri Pacific. The employees maintained that agreements between them and the management of the road had been violated through the operation of Missouri Pacific trains by Missouri Pacific train crews over the line of the Texas & Pacific between Alexandria, La., and New Orleans. According to testimony of representatives of the railways, joint operation of the Texas & Pacific with the Missouri Pacific had begun in 1916 and had not been seriously protested until 1923. It was also pointed out that while present officers of the labor organizations now oppose such operation, previous officers had conceded to the Missouri Pacific the right to operate its trains with its own crews on joint tracks.

To Economize Words and Wires

The Kansas City Southern, which has been conducting a "campaign" against needless telegraphing, announces successful results; a definite improvement in its wire service. The company's Bulletin for January 15, telling of this, adds:

"The superintendent of telegraph is seeing to it that no messages are being sent from Kansas City which contain unnecessary words. Superfluous words in messages received at Kansas City from points on the line are marked, and the attention of the sender called to them. This is being given more substantial support than any of the previous campaigns, and has resulted in a real and noticeable improvement in the wire service. The regular telegraphic reports are being received in the general office on time, and telegrams are being handled in good time, many within ten minutes or less, and the great majority within an hour of the time they are filed."

The rules, to which all officers and employees are expected to give heed, include the following:

1—Only such wire reports and communications as are essential to efficient operation should be made.

2—Replies to telegrams calling for an answer must be expedited and thus avoid follow-up requests.

3—The use of symbols in accordance with existing instructions will continue.

4—Offer no communication for wire transmission when the purpose may be served by using the mail.

5—All officers receiving telegrams which in their judgment are unnecessary or contain superfluous words will handle with the sender or his superior for correction.

6—The use of local and long distance railroad and commercial telephones will be limited to necessary exclusive railroad communication so far as practicable.

With the announcement of the campaign there was established in each department office a censor, charged to scrutinize each telegram after it has been written, and to indicate approval [or disapproval] by penciling his initials on the lower left side corner of the telegram.

A Proposal to Hold Up Nickel Plate Decision

A Senate resolution introduced in the Senate on February 16 by Senator Wheeler of Montana would "request and direct" the Interstate Commerce Commission to withhold decision on the application of the New York, Chicago & St. Louis and other roads, looking to their common control and eventual consolidation, or other applications of the same nature, "until Congress has, by amendments to the act to regulate commerce, resulting from pending bills, prescribed the conditions and means by which such consolidations may be effective." The resolution states that "decisions prior to the expression of the will of the Congress may adversely affect the public interest." It was referred to the committee on interstate commerce. Passage of such a resolution would be only an expression on the part of the Senate as the commission is governed in the matter by a law enacted by Congress and approved by the President. At a hearing earlier in the day Senator Wheeler had referred to the proposed Nickel Plate plan as one designed primarily for the purpose of making profits for promoters and bankers.

OPERATING REVENUES AND OPERATING EXPENSES OF CLASS I STEAM ROADS IN THE UNITED STATES (FOR 191 STEAM ROADS, INCLUDING 16 SWITCHING AND TERMINAL COMPANIES)

FOR THE MONTH OF DECEMBER, 1925 AND 1924

Item	United States		Eastern Region		Pocahontas Region		Southern Region		Western District	
	1925	1924	1925	1924	1925	1924	1925	1924	1925	1924
Average number of miles operated	237,048.48	236,279.26	59,343.08	59,509.30	5,539.54	5,531.86	38,726.35	38,387.05	133,439.51	132,851.05
Revenues:										
Freight	\$379,504,886	\$362,217,185	\$162,563,241	\$156,450,406	\$19,495,456	\$19,986,680	\$56,063,383	\$50,933,861	\$141,382,806	\$134,846,238
Passenger	a 91,996,725	b 90,850,008	43,256,399	42,908,957	2,078,435	2,163,458	16,069,357	13,851,220	30,592,534	31,926,373
Mail	9,840,752	9,960,352	3,650,648	3,753,366	217,392	217,392	1,403,742	1,451,161	4,570,514	4,538,433
Express	14,492,516	14,753,429	7,037,011	5,991,379	322,267	330,554	1,314,042	2,303,764	5,819,196	6,127,732
All other transportation	17,123,897	16,995,758	9,433,678	8,832,635	254,583	255,957	1,149,143	1,274,385	6,286,493	6,652,781
Incidental	10,379,861	9,748,723	5,268,477	4,861,065	391,683	392,595	1,525,382	1,168,980	3,194,319	3,326,083
Joint facility—Cr.	965,254	940,390	308,956	383,537	27,896	22,430	171,823	138,649	456,579	395,774
Joint facility—Dr.	296,506	289,401	53,912	163,856	3,285	3,136	34,860	30,940	204,449	91,469
Ry. operat'g revenues	524,007,385	505,176,444	231,464,480	223,017,489	22,782,883	23,345,930	77,662,012	71,091,080	192,097,992	187,721,945
Expenses:										
Maintenance of way and structures	63,832,421	59,566,639	28,997,850	25,987,737	2,635,543	3,085,597	9,241,933	8,935,651	22,957,095	21,557,654
Mainten'ce of equipm't	108,690,170	106,132,270	52,652,881	51,470,221	4,792,869	5,483,883	14,439,016	13,038,590	36,805,404	36,139,576
Traffic	9,486,599	8,648,609	3,422,295	3,163,458	245,907	208,154	1,924,455	1,684,052	3,893,942	3,592,945
Transportation	189,298,648	189,990,170	87,901,730	87,267,838	6,373,858	6,421,746	27,208,079	24,698,012	67,814,981	71,602,574
Miscellaneous operat'ns	4,616,485	4,248,174	2,157,305	2,046,122	96,263	85,510	691,028	502,744	1,671,889	1,613,798
General	15,476,798	14,679,889	7,071,131	6,634,030	487,726	470,361	1,945,493	1,909,654	5,972,448	5,665,844
Transportation for investment—Cr.	1,751,010	1,790,967	299,449	296,123	47,172	145,622	307,600	258,175	1,096,789	1,091,047
Ry. operat'g expenses	389,650,111	381,474,784	181,903,743	176,273,283	14,584,994	15,609,629	55,142,404	50,510,528	138,018,970	139,081,344
Net revenues from railway operations	134,357,274	123,701,660	49,560,755	46,744,206	8,197,889	7,736,301	22,519,608	20,580,552	54,079,022	48,640,601
Railway tax accruals	31,871,123	29,191,047	10,639,860	10,594,545	2,396,295	1,228,444	5,006,396	4,665,474	13,828,572	12,702,584
Uncollectible ry. revs.	259,625	433,544	95,180	81,426	3,643	130,996	40,060	113,785	120,742	107,337
Ry. operating income	102,226,526	94,077,069	38,825,715	36,068,235	5,797,951	6,376,861	17,473,152	15,801,293	40,129,708	35,830,680
Equipm't rents—Dr. bal.	6,190,874	5,756,295	2,843,351	2,672,881	d591,888	d410,060	1,764,116	625,017	2,175,295	2,868,457
Joint facility rent—Dr. balance	1,368,375	1,626,011	408,054	891,801	26,644	d1,319	87,791	142,243	845,886	593,286
Net ry. oper'g income	94,667,277	86,694,763	35,574,310	32,503,553	6,363,195	6,788,240	15,621,245	15,034,033	37,108,527	32,368,937
Ratio of expenses to revenues (per cent)...	74.36	75.51	78.59	79.04	64.02	66.86	71.00	71.05	71.85	74.09

FOR TWELVE MONTHS ENDED WITH DECEMBER, 1925 AND 1924

Average number of miles operated	236,771.21	236,164.24	59,437.28	59,537.74	5,518.69	5,517.63	38,549.19	38,358.97	133,266.05	132,749.90
Revenues:										
Freight	4,553,065,290	4,349,036,142	1,989,176,716	1,912,027,643	224,418,196	200,451,929	627,215,454	581,500,530	1,712,254,924	1,655,056,040
Passenger	c 1,055,913,165	d 1,076,688,006	518,975,691	524,237,671	23,051,615	24,822,590	157,683,848	147,674,787	356,202,011	379,816,958
Mail	97,051,749	97,974,248	36,995,943	37,339,145	2,474,076	2,455,281	13,971,290	13,929,030	43,610,440	44,250,792
Express	145,223,077	143,403,761	70,203,896	62,105,873	3,371,552	3,241,968	19,445,414	19,595,523	52,202,215	58,460,397
All other transportation	200,472,133	193,617,359	115,509,819	109,960,057	2,497,357	2,423,019	11,969,404	11,645,216	70,495,553	69,589,067
Incidental	126,894,952	119,145,651	62,958,770	60,523,717	4,168,835	4,120,480	15,035,338	12,813,329	44,732,009	41,688,125
Joint facility—Cr.	11,093,901	10,432,609	4,461,578	4,360,821	202,462	188,714	1,674,259	1,557,064	4,755,602	4,326,010
Joint facility—Dr.	3,105,700	2,635,550	956,841	1,322,989	27,643	28,706	417,807	372,488	1,703,409	911,367
Ry. operat'g revenues	6,186,608,567	5,987,662,226	2,797,325,572	2,709,367,938	260,156,450	237,675,275	846,577,200	788,342,991	2,282,549,345	2,252,276,022
Expenses:										
Maintenance of way and structures	824,892,860	802,672,810	352,049,190	331,761,099	37,901,252	34,472,347	117,851,649	112,058,063	317,090,769	324,381,301
Mainten'ce of equipm't	1,268,724,179	1,270,717,504	610,071,202	606,489,555	58,762,760	59,408,058	162,016,550	159,801,939	437,873,667	445,017,952
Traffic	106,236,413	99,103,854	39,319,929	37,177,896	2,763,072	2,496,408	19,078,033	17,410,331	45,075,379	42,019,219
Transportation	2,165,666,936	2,181,295,655	1,012,121,421	1,031,484,262	71,430,460	71,806,975	290,783,435	280,852,099	791,331,620	797,152,319
Miscellaneous operat'ns	54,106,346	50,437,693	24,636,974	24,038,952	1,073,294	1,005,327	6,569,366	4,969,502	21,826,712	20,423,912
General	176,862,548	169,289,863	79,694,298	74,880,680	5,599,691	5,402,181	22,538,105	21,956,783	69,030,454	67,050,219
Transportation for investment—Cr.	13,233,672	13,722,970	2,073,167	1,900,778	689,771	557,608	2,345,472	1,957,726	8,125,262	9,306,858
Ry. operat'g expenses	4,583,255,610	4,559,794,409	2,115,819,847	2,103,931,666	176,840,758	174,033,688	616,491,666	595,090,991	1,674,103,339	1,686,738,064
Net revenue from railway operations	1,603,352,957	1,427,867,817	681,505,725	605,436,272	83,315,692	63,641,587	230,085,534	193,252,000	608,446,006	565,537,958
Railway tax accruals	363,242,428	344,542,188	145,954,397	138,092,882	17,452,300	14,218,095	50,960,734	45,004,865	148,874,997	147,226,346
Uncollectible ry. revs.	1,935,948	2,327,295	907,148	931,243	80,834	176,241	243,551	301,465	704,415	918,346
Ry. operating income	1,238,174,581	1,080,998,334	534,644,180	466,412,147	65,782,558	49,247,251	178,881,249	147,945,670	458,866,594	417,393,266
Equipm't rents—Dr. bal.	78,956,622	73,251,841	40,946,942	41,922,209	d6,522,354	d4,332,318	10,035,270	4,011,598	34,496,764	31,650,352
Joint facility rent—Dr. balance	22,233,716	21,028,734	9,938,688	10,876,265	1,039,996	1,011,857	1,290,641	1,380,266	9,964,391	7,760,346
Net ry. oper'g income	1,136,984,243	986,717,759	483,758,550	413,613,673	71,264,916	52,567,712	167,555,338	142,553,806	414,405,439	377,982,568
Ratio of expenses to revenues (per cent)...	74.08	76.15	75.64	77.65	67.97	73.22	72.82	75.49	73.34	74.89

a Includes \$3,412,802 sleeping and parlor car surcharge. b Includes \$2,940,549 sleeping and parlor car surcharge. c Includes \$39,841,433 sleeping and parlor car surcharge. d Deficit or other reverse items.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents, 1924
		Freight	Passenger	Total	Way and structures	Equip. ment	Traffic				
Akron, Canton & Youngstown.....	Dec. 171	\$257,992	\$467	\$271,185	\$49,595	\$32,397	\$11,279	68.8	\$84,635	\$67,495	\$26,898
Alabama & Vicksburg.....	Dec. 171	3,050,454	5,425	3,194,729	487,309	399,781	1,333,348	60.9	1,247,543	1,068,709	624,433
Alabama & Vicksburg.....	Dec. 141	2,183,378	6,207	2,193,585	55,395	57,549	1,123,355	92.0	1,517,882	24,372	36,965
Alabama & Vicksburg.....	Dec. 141	2,632,489	688,960	3,321,449	528,760	592,260	1,244,040	72.9	996,612	640,053	527,303
Vicksburg, Shreveport & Pacific.....	Dec. 188	314,440	75,798	416,800	66,738	60,190	133,652	82.2	113,122	81,180	66,075
Ann Arbor.....	Dec. 188	3,482,707	77,771	4,520,070	743,406	718,738	1,627,419	71.8	1,103,129	776,381	617,968
Ann Arbor.....	Dec. 293	4,484,155	30,861	5,106,611	39,425	109,518	1,311,919	81.1	1,946,565	63,999	180,970
Ann Arbor.....	Dec. 293	5,327,943	320,629	5,867,692	615,119	1,171,277	1,290,076	75.6	1,429,909	1,161,292	1,028,837
Atchison, Topeka & Santa Fe.....	Dec. 9,245	11,551,688	3,213,717	16,473,163	2,017,691	3,133,965	5,526,400	68.3	5,224,432	3,914,142	3,635,698
Atchison, Topeka & Santa Fe.....	Dec. 9,190	14,136,910	3,902,358	19,439,057	2,713,428	3,896,411	6,058,129	68.6	6,164,590	4,567,958	3,834,299
Gulf, Colorado & Santa Fe.....	Dec. 1,908	2,315,134	320,559	2,795,086	375,817	494,707	771,086	62.1	1,051,763	930,190	816,029
Gulf, Colorado & Santa Fe.....	Dec. 1,908	2,434,900	377,559	2,922,164	5,518,734	5,682,114	596,984	73.5	7,756,286	6,642,755	5,271,601
Panhandle & Santa Fe.....	Dec. 923	891,324	146,549	1,117,158	104,513	205,962	18,176	54.8	504,803	428,944	372,817
Panhandle & Santa Fe.....	Dec. 863	9,151,225	1,436,265	11,257,307	1,552,060	2,235,380	105,100	64.4	4,002,924	3,443,481	2,788,766
Atlanta & West Point.....	Dec. 93	169,090	74,447	273,465	33,587	46,888	11,466	76.1	64,983	48,025	36,711
Atlanta & West Point.....	Dec. 93	1,929,128	863,571	3,184,981	376,253	528,753	1,255,908	75.1	791,916	600,662	462,206
Western of Alabama.....	Dec. 133	192,109	70,120	283,654	23,780	55,026	12,043	71.8	80,088	62,117	61,225
Western of Alabama.....	Dec. 133	2,291,380	797,586	3,392,382	380,541	610,133	1,002,349	68.1	1,080,992	868,494	823,777
Atlanta, Birmingham & Atlantic.....	Dec. 639	449,235	56,273	554,007	90,359	336,917	22,733	123.1	123,376	188,530	183,541
Atlanta, Birmingham & Atlantic.....	Dec. 639	4,520,043	541,829	5,448,188	1,045,012	1,424,043	2,888,498	92.3	4,202,022	2,912,206	2,107,104
Atlantic Coast Line.....	Dec. 4,912	6,063,965	2,480,633	9,267,124	992,828	1,565,120	1,695,554	68.8	2,892,546	2,286,420	1,773,696
Atlantic Coast Line.....	Dec. 4,890	6,657,122	2,042,719	9,399,698	10,820,231	17,544,835	1,724,881	69.1	29,031,577	22,411,542	20,184,346
Charleston & Western Carolina.....	Dec. 342	322,176	27,952	360,850	72,105	39,085	8,074	71.9	101,311	71,452	53,730
Charleston & Western Carolina.....	Dec. 342	3,626,010	313,207	4,118,309	688,169	518,579	1,812,278	71.9	1,159,093	900,793	753,628
Baltimore & Ohio.....	Dec. 5,294	16,662,919	2,335,281	20,496,257	2,278,786	4,364,148	381,057	77.4	5,268,880	4,373,872	3,975,413
Baltimore & Ohio.....	Dec. 5,292	19,558,361	27,904,665	23,546,940	28,440,416	53,206,661	4,551,082	75.4	58,447,343	48,329,024	43,034,087
Baltimore & Ohio Chicago Term.....	Dec. 80	.....	.....	280,474	1,934	42,802	113,710	63.0	103,682	19,399	62,782
Baltimore & Ohio Chicago Term.....	Dec. 80	.....	.....	3,605,954	396,587	444,350	1,879,323	81.3	676,142	94,164	1,203,524
Staten Island Rapid Transit.....	Dec. 33	105,217	106,200	235,244	147,465	19,743	2,102	134.8*	81,417	98,937	132,796
Staten Island Rapid Transit.....	Dec. 33	1,203,940	1,416,139	2,981,137	764,732	339,630	24,501	93.4	192,700	3,023	292,018
Bangor & Aroostook.....	Dec. 616	435,474	80,688	548,403	101,030	150,459	5,078	81.1	103,539	57,221	82,648
Bangor & Aroostook.....	Dec. 616	5,867,703	694,413	6,862,487	1,268,914	1,410,353	57,353	71.6	1,948,621	1,376,181	1,707,091
Belt Ry. Co. of Chicago.....	Dec. 32	.....	.....	598,625	61,181	31,397	3,277	72.4	164,904	120,152	162,098
Belt Ry. Co. of Chicago.....	Dec. 32	815,969	71,019	861,339	73,340	32,273	39,097	66.6	2,357,560	1,822,994	1,401,233
Bessmer & Lake Erie.....	Dec. 228	15,050,901	219,733	15,466,685	1,102,468	4,189,630	179,740	88.9	96,473	40,835	124,721
Bessmer & Lake Erie.....	Dec. 228	.....	.....	47,553	7,940	6,606	1,471	69.6	14,439	4,477	19,718
Bingham & Garfield.....	Dec. 33	.....	.....	604,219	111,654	111,725	17,138	74.7	152,897	22,677	179,811
Bingham & Garfield.....	Dec. 2,228	4,315,099	1,610,271	6,798,677	820,575	1,204,135	68,364	76.5	1,600,582	1,328,002	1,077,318
Bingham & Garfield.....	Dec. 2,247	50,153,128	19,749,528	79,689,770	10,022,334	15,689,318	792,102	77.7	17,794,438	14,661,625	11,724,891
Brooklyn Eastern District Term.....	Dec. 9	1,171,116	.....	1,171,116	1,186	461	890	48.2	65,138	58,043	58,043
Brooklyn Eastern District Term.....	Dec. 9	1,377,282	.....	1,377,282	1,459,094	87,674	527,079	57.9	613,455	527,765	530,694
Buffalo & Susquehanna R. R. Corp.....	Dec. 233	81,178	2,971	91,149	17,780	40,181	3,701	109.7	8,865	8,865	4,420
Buffalo & Susquehanna R. R. Corp.....	Dec. 233	1,367,642	44,240	1,463,351	349,966	565,524	472,824	103.7	54,085	91,254	103,790
Buffalo, Rochester & Pittsburgh.....	Dec. 601	1,319,954	126,368	1,510,051	145,176	380,182	28,311	75.8	365,990	300,467	364,956
Buffalo, Rochester & Pittsburgh.....	Dec. 595	14,314,886	1,442,158	16,560,781	2,100,405	4,527,035	6,229,922	82.7	2,870,052	2,374,037	2,650,758
Canadian Pacific, Lines in Maine.....	Dec. 233	267,490	39,000	319,886	22,202	66,514	7,100	74.7	80,823	75,198	55,236
Canadian Pacific, Lines in Maine.....	Dec. 233	1,779,985	367,449	2,320,034	666,676	525,418	1,076,140	102.4	56,494	177,119	305,898
Central of Georgia.....	Dec. 1,920	1,858,525	615,885	2,704,072	349,448	431,953	76,888	71.0	784,724	683,189	583,654
Central of Georgia.....	Dec. 1,920	21,452,533	6,099,378	30,226,408	4,663,221	5,191,129	10,970,861	75.2	7,491,927	6,142,643	4,555,802
Central of New Jersey.....	Dec. 690	2,687,768	700,719	3,726,093	537,245	1,107,987	112,800	95.6	165,701	277,422	335,831
Central of New Jersey.....	Dec. 691	41,617,589	9,668,743	55,092,100	6,300,306	12,113,409	481,821	75.1	13,703,955	9,134,202	7,753,462
Central Vermont.....	Dec. 434	432,000	96,849	617,743	55,691	97,230	13,936	75.0	154,532	130,165	105,619
Central Vermont.....	Dec. 434	6,318,016	1,284,214	8,460,908	1,746,497	1,378,291	2,725,920	87.0	1,102,888	864,265	647,720
Chesapeake & Ohio.....	Dec. 2,635	9,484,428	799,017	10,247,927	949,485	2,692,002	3,186,062	67.2	3,525,532	2,288,162	2,371,552
Chesapeake & Ohio.....	Dec. 2,614	108,283,190	9,633,037	123,184,103	18,778,635	31,128,452	1,310,418	72.2	34,202,684	27,390,394	30,018,072
Chicago & Alton.....	Dec. 1,055	1,823,170	586,557	2,712,004	260,569	615,031	64,148	74.6	688,464	566,422	397,331
Chicago & Alton.....	Dec. 1,055	21,827,472	3,736,320	28,099,003	3,809,003	6,197,487	784,152	75.4	7,650,112	6,359,094	4,547,871
Chicago & Eastern Illinois.....	Dec. 945	1,998,746	4,527,685	6,526,431	2,511,717	704,015	84,757	79.3	346,772	410,459	375,856
Chicago & Eastern Illinois.....	Dec. 945	19,924,411	2,674,508	22,598,919	2,654,577	7,740,582	9,904,912	83.1	4,490,898	3,084,256	2,148,267
Chicago & North Western.....	Dec. 8,469	8,000,901	2,338,198	12,224,342	1,563,731	2,603,572	4,834,238	78.1	2,676,966	1,466,554	1,354,143
Chicago & North Western.....	Dec. 8,467	104,888,463	26,769,126	148,338,269	20,988,357	30,613,192	56,955,610	77.8	32,912,214	22,861,117	21,108,750
Chicago, Burlington & Quincy.....	Dec. 9,404	10,238,998	2,081,893	13,731,179	1,495,832	2,398,574	4,868,574	73.5	3,636,165	2,610,157	2,337,978
Chicago, Burlington & Quincy.....	Dec. 9,398	118,670,808	25,116,398	155,155,178	19,737,018	33,669,420	2,993,580	73.3	42,483,309	31,457,885	28,131,917
Chicago Great Western.....	Dec. 1,496	1,540,248	338,939	2,068,589	190,043	339,263	878,720	75.7	501,657	393,427	351,118
Chicago Great Western.....	Dec. 1,496	18,844,285	6,327,611	24,502,760	3,442,378	8,490,838	9,801,931	80.9	4,690,042	3,687,931	2,687,931
Chicago Indianapolis & Louisville.....	Dec. 647	1,166,958	219,525	1,345,876	158,758	313,930	589,812	74.2	399,711	318,510	130,315
Chicago Indianapolis & Louisville.....	Dec. 650	11,156,909	2,807,328	14,666,040	1,841,715	3,766,047	419,144	72.8	4,816,846	3,920,363	2,843,523

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925---CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Maintenance of way and structures		Operating expenses			Operating income (or loss)	Net after rents	Net after 1924
		Freight	Passenger	Total	Way and structures	Equip-ment	Traffic	Trans-portion	General			
Chicago Milwaukee & St. Paul	Dec. 11 205	\$10,477,045	\$1,751,352	\$13,785,261	\$1,186,172	\$3,296,612	\$247,434	\$5,251,867	\$337,864	\$10,336,514	\$2,281,268	\$2,261,198
Chicago Milwaukee & St. Paul	Dec. 11 205	\$10,477,045	\$1,751,352	\$13,785,261	\$1,186,172	\$3,296,612	\$247,434	\$5,251,867	\$337,864	\$10,336,514	\$2,281,268	\$2,261,198
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Chicago Milwaukee & St. Paul	Dec. 11 205	\$10,477,045	\$1,751,352	\$13,785,261	\$1,186,172	\$3,296,612	\$247,434	\$5,251,867	\$337,864	\$10,336,514	\$2,281,268	\$2,261,198
Chicago Milwaukee & St. Paul	Dec. 11 205	\$10,477,045	\$1,751,352	\$13,785,261	\$1,186,172	\$3,296,612	\$247,434	\$5,251,867	\$337,864	\$10,336,514	\$2,281,268	\$2,261,198
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Chicago Milwaukee & St. Paul	Dec. 11 205	\$10,477,045	\$1,751,352	\$13,785,261	\$1,1							

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Total	Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1924
		Freight	Passenger	Total	Maintenance of way and structures	Equip. ment	Traffic						
Grand Trunk Western.....	Dec. 347	\$1,300,101	\$177,765	\$1,596,145	\$149,097	\$282,051	\$31,861	\$550,717	\$56,116	\$1,077,664	\$463,247	\$345,202	\$286,998
Atlantic & St. Lawrence.....	12 mos. 347	15,302,152	2,202,905	18,594,290	2,253,080	4,423,564	448,053	6,547,004	647,492	14,427,694	3,393,327	1,966,793	425,645
Chic., Det. & Canada Gr. Tr. 12 mos.	166	265,419	31,647	313,353	43,727	58,352	5,372	149,593	8,369	269,268	29,334	21,038	65,883
Det., Grand Haven & Milwaukee. 12 mos.	166	1,911,635	370,499	2,472,239	565,147	434,063	71,011	1,301,656	99,415	2,488,776	216,247	882,844	1,231,835
Great Northern.....	Dec. 59	2,660,854	52,695	3,223,671	380,391	137,355	49,938	1,023,970	42,638	1,634,148	1,477,316	1,106,575	895,920
Green Bay & Western.....	12 mos. 189	477,697	38,690	566,676	55,717	35,432	11,133	250,682	17,449	370,179	191,209	89,889	53,752
Gulf & Ship Island.....	12 mos. 189	6,036,151	404,029	7,080,923	842,179	555,431	133,480	2,979,949	200,175	4,713,257	2,312,769	1,134,328	290,798
Gulf, Mobile & Northern.....	Dec. 8,221	6,871,229	1,193,311	8,974,419	752,948	1,465,042	205,738	3,134,664	209,523	5,906,287	2,216,296	2,198,171	1,707,433
Hocking Valley.....	12 mos. 8,242	90,098,763	13,955,742	114,924,960	14,297,715	17,200,491	2,354,083	38,406,288	2,662,601	75,827,288	29,287,882	28,276,133	24,201,287
Illinois Central.....	Dec. 234	128,513	7,210	143,543	17,260	20,638	5,179	53,793	2,848	69,567	29,976	27,892	21,838
Illinois Central Combined.....	12 mos. 234	1,408,261	87,231	1,578,446	296,187	204,002	52,852	554,602	33,739	1,140,676	332,376	264,692	191,772
Yazoo & Mississippi Valley.....	Dec. 307	251,840	50,313	338,140	110,973	76,839	3,729	126,599	7,905	330,954	14,111	14,198	19,598
Kansas City, Mexico & Orient.....	12 mos. 307	2,952,295	495,231	3,768,812	752,511	620,983	82,090	1,189,500	149,503	2,883,396	563,457	283,281	555,986
Kans. City, Mex. & Orient of Tex. 12 mos.	466	457,232	38,905	519,038	83,392	63,379	28,364	176,175	30,241	580,776	97,743	91,776	80,916
Kansas City Southern.....	Dec. 466	5,667,035	400,868	6,321,030	927,247	963,358	286,766	1,861,110	294,045	4,338,040	1,493,947	1,389,969	1,211,976
Texasarkana & Ft. Smith.....	Dec. 348	1,447,968	72,633	1,618,826	114,179	441,797	15,311	536,987	39,012	1,147,763	336,184	369,841	260,117
Kansas City Southern.....	12 mos. 348	17,094,153	816,865	19,695,712	2,478,769	5,380,978	172,955	5,815,393	424,859	14,309,397	4,128,776	3,615,213	3,018,080
Illinois Central.....	Dec. 4,874	10,440,832	2,368,542	13,677,410	1,804,554	3,060,404	276,360	5,835,314	384,839	10,547,348	2,292,008	2,276,388	2,066,900
Yazoo & Mississippi Valley.....	12 mos. 4,874	117,239,369	24,747,703	155,305,185	22,621,602	34,386,924	5,680,383	59,880,552	3,874,992	117,904,258	24,657,009	23,113,866	23,761,649
Illinois Central.....	Dec. 1,379	1,935,757	398,943	2,440,625	344,938	409,617	29,083	800,807	48,629	1,622,193	506,081	445,749	486,427
Illinois Central Combined.....	12 mos. 1,380	19,228,542	3,451,289	24,666,440	3,734,257	4,270,758	352,399	8,996,435	575,956	17,476,269	7,018,174	4,813,077	4,340,425
Kansas City, Mexico & Orient.....	Dec. 6,254	12,276,589	2,767,485	16,112,034	2,209,448	3,414,021	105,643	5,736,321	383,468	12,079,741	2,798,089	2,722,137	2,533,327
Kans. City, Mex. & Orient of Tex. 12 mos.	5,255	137,168,131	28,198,992	176,169,625	26,335,919	38,655,929	3,061,282	62,476,828	4,450,948	135,382,522	30,018,903	29,926,943	28,102,074
Kansas City Southern.....	Dec. 272	108,590	9,269	127,392	44,238	121,892	6,904	60,159	7,416	240,609	117,370	54,086	7,889
Kans. City, Mex. & Orient of Tex. 12 mos.	272	2,215,857	98,995	2,411,096	677,423	885,812	69,533	853,379	193,300	2,278,996	278,996	56,372	26,517
Texasarkana & Ft. Smith.....	Dec. 465	210,122	18,275	240,273	81,667	75,152	7,346	94,927	7,562	266,654	34,295	239,376	7,689
Kansas City Southern.....	12 mos. 465	2,892,846	180,384	3,189,212	672,186	710,459	75,844	1,084,965	83,223	2,626,284	477,597	324,72	168,719
Kansas City Southern.....	Dec. 784	1,232,682	157,331	1,544,704	205,964	265,491	58,290	504,837	81,483	1,104,920	345,068	293,000	144,717
Texasarkana & Ft. Smith.....	12 mos. 777	14,855,173	1,610,301	18,231,458	2,502,687	3,204,762	561,072	5,785,742	920,633	12,944,903	4,122,618	3,720,748	3,021,319
Kansas, Oklahoma & Gulf.....	Dec. 81	2,584,399	139,098	2,933,697	340,412	268,805	73,598	822,015	120,275	1,640,900	1,096,452	772,678	843,057
Lake Superior & Ishpeming.....	Dec. 314	257,883	8,275	273,014	73,542	122,325	5,690	85,658	10,031	199,730	36,912	42,190	1,383
Lake Superior & Ishpeming.....	12 mos. 314	2,848,288	89,478	2,539,969	721,370	389,134	107,919	932,000	112,779	2,259,591	273,277	27,850	32,291
Lake Superior & Ishpeming.....	Dec. 161	50,100	4,104	57,639	29,023	24,752	1,406	35,516	8,272	98,913	64,196	61,805	81,085
Lake Superior & Ishpeming.....	12 mos. 161	1,945,024	39,532	2,252,532	417,699	299,792	6,654	588,255	63,672	1,375,600	646,509	612,858	251,166
Lake Superior & Ishpeming.....	Dec. 13	.....	.....	87,049	8,561	18,601	.....	50,768	1,814	79,744	2,469	2,214	18,007
Lake Superior & Ishpeming.....	12 mos. 13	.....	.....	1,182,481	178,979	217,355	.....	676,488	20,976	1,093,799	6,348	26,713	125,424
Lake Superior & Ishpeming.....	Dec. 96	190,639	2,433	206,573	29,166	53,078	3,194	101,799	10,517	197,751	8,822	17,889	25,066
Lake Superior & Ishpeming.....	12 mos. 96	2,853,858	33,006	3,053,599	379,506	529,028	26,295	1,184,994	118,195	2,237,097	660,977	378,422	449,960
Lake Superior & Ishpeming.....	Dec. 219	238,512	1,138	246,693	34,051	61,457	4,772	133,740	18,269	351,864	142,6	105,171	26,058
Lake Superior & Ishpeming.....	12 mos. 219	5,183,746	16,906	5,295,382	721,370	389,134	107,919	932,000	112,779	2,259,591	273,277	27,850	32,291
Lake Superior & Ishpeming.....	Dec. 1,363	3,898,168	652,914	5,005,847	493,555	1,068,874	121,669	2,326,374	138,665	4,321,799	684,048	626,292	582,188
Lake Superior & Ishpeming.....	12 mos. 1,370	60,742,356	8,034,040	74,430,573	8,574,752	15,910,874	1,491,868	29,361,230	1,735,373	57,433,390	77,2	16,997,183	11,391,546
Louisiana & Arkansas.....	Dec. 302	326,877	2,818	329,695	30,456	57,616	11,755	104,618	16,709	220,130	117,530	100,618	41,124
Louisiana Ry. & Nav. Co.....	12 mos. 302	3,722,675	264,827	4,000,922	621,460	705,581	128,403	1,027,846	166,596	2,622,903	362,927	863,230	602,473
Louisiana Ry. & Nav. Co.....	Dec. 337	321,755	21,867	356,552	70,130	58,188	9,121	112,035	10,372	266,871	89,643	56,270	17,352
Louisiana Ry. & Nav. Co. of Texas Dec.	337	4,007,690	232,641	3,859,690	591,103	391,103	130,331	1,500,167	122,021	3,185,713	418,586	28,781	253,291
Louisiana Ry. & Nav. Co. of Texas Dec.	206	113,631	8,864	129,026	23,364	26	2,035	48,174	5,406	78,974	46,913	29,187	2,781
Louisiana Ry. & Nav. Co. of Texas Dec.	12 mos. 206	1,172,926	109,113	1,277,904	167,994	267,994	36,284	594,518	67,457	1,090,770	209,279	2,913	48,710
Louisiana Ry. & Nav. Co. of Texas Dec.	Dec. 5,038	9,881,660	2,080,240	11,961,900	2,678,109	3,044,397	4,681,651	26,714	9,708,508	70,5	3,099,396	2,232,453	2,227,090
Louisiana Ry. & Nav. Co. of Texas Dec.	12 mos. 5,041	111,118,085	22,799,553	142,244,307	20,334,951	32,149,513	2,895,067	49,144,203	3,324,735	108,402,256	26,938,619	22,921,374	22,921,374
Louisiana Ry. & Nav. Co. of Texas Dec.	Dec. 199	283,420	57,818	354,683	88,303	46,988	9,159	174,173	10,898	329,521	13,738	4,994	77,421
Louisiana Ry. & Nav. Co. of Texas Dec.	12 mos. 199	2,955,370	664,569	3,388,398	768,968	502,173	89,175	1,240,996	116,405	2,717,717	70,8	132,681	884,526
Louisiana Ry. & Nav. Co. of Texas Dec.	Dec. 1,154	1,133,125	323,152	1,607,264	166,197	312,477	13,086	697,233	55,806	1,244,701	362,961	265,097	103,438
Louisiana Ry. & Nav. Co. of Texas Dec.	12 mos. 1,198	14,282,725	3,911,832	20,670,587	2,966,147	3,908,765	168,400	8,012,393	595,153	15,667,752	3,216,138	3,104,359	2,307,681
Midland Valley.....	Dec. 364	291,785	39,717	344,647	60,079	57,794	8,181	94,872	21,253	235,253	103,879	78,065	66,318
Midland Valley.....	12 mos. 364	3,730,581	480,424	4,312,168	714,342	557,398	77,490	1,227,291	227,791	2,7777			

REVENUES AND EXPENSES OF RAILWAYS

MONTHS OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925—(CONTINUED)

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net after rents	Net after rents, 1924
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip. ment	Traffic				
Missouri & North Arkansas.....	Dec. 364	\$100,437	\$18,106	\$127,830	\$37,923	\$44,470	\$6,018	\$59,682	\$7,888	\$155,981	\$1,783
Missouri-Kansas-Texas.....	12 mos. 364	1,234,004	205,384	1,548,441	364,096	303,369	65,512	615,423	87,739	1,435,250	62,733
Missouri Pacific.....	Dec. 1,799	2,353,808	439,092	3,042,867	317,831	840,751	38,806	786,931	89,204	2,106,296	903,227
Missouri-Kansas-Texas of Texas.....	12 mos. 1,799	27,849,538	4,874,677	33,325,003	3,771,040	8,197,258	58,606	9,330,094	1,090,538	22,861,964	9,121,952
Missouri Pacific.....	Dec. 1,389	1,572,204	422,113	2,176,394	308,154	208,022	43,061	825,668	66,051	1,438,260	456,185
Missouri Pacific.....	12 mos. 1,389	15,928,105	4,450,382	20,378,487	3,633,533	3,225,525	18,956	7,953,633	795,633	16,754,479	3,674,546
Missouri Pacific.....	Dec. 7,337	8,930,305	1,416,898	11,266,732	1,828,914	2,231,243	306,440	4,155,790	341,599	8,827,812	1,439,546
Missouri Pacific.....	12 mos. 7,337	104,319,277	16,536,035	130,831,661	20,465,706	25,895,938	3,108,345	48,407,743	3,929,948	102,276,499	15,817,584
Gulf Coast Lines.....	Dec. 922	789,270	203,607	1,079,260	109,741	273,735	48,825	378,333	66,063	881,049	56,804
International-Great Northern.....	12 mos. 922	1,787,381	2,044,295	3,831,676	2,216,018	2,401,637	454,873	4,617,456	621,139	9,828,646	3,945,092
International-Great Northern.....	Dec. 1,159	1,194,193	226,320	1,586,424	204,511	300,833	36,775	621,869	73,023	1,231,813	326,095
International-Great Northern.....	12 mos. 1,159	13,176,198	2,276,800	17,083,748	3,085,733	2,882,165	415,722	6,654,869	698,551	13,517,750	3,565,998
Texas & Pacific.....	Dec. 1,953	2,676,912	634,165	3,611,762	528,520	725,250	86,357	1,148,889	95,776	2,533,752	721,132
Mobile & Ohio.....	12 mos. 1,952	26,051,237	6,558,959	35,272,899	5,205,646	6,982,329	786,060	12,363,073	1,127,694	26,453,802	5,974,105
Mobile & Ohio.....	Dec. 1,161	1,411,289	136,880	1,643,137	258,755	255,256	50,192	578,655	50,211	1,195,380	206,896
Mobile & Ohio.....	12 mos. 1,161	16,603,582	1,594,307	19,255,063	2,809,052	3,282,238	605,342	6,638,250	549,470	13,882,643	3,532,155
Monongahela.....	Dec. 129	569,494	264,538	604,775	63,518	68,076	1,066	186,481	9,954	328,254	133,967
Monongahela Connecting.....	12 mos. 130	5,604,343	284,636	5,948,448	701,018	733,076	13,432	1,573,858	115,640	3,130,593	1,068,517
Monongahela Connecting.....	Dec. 7	.....	.....	223,502	20,202	37,313	398	113,261	2,708	173,882	31,599
Monongahela Connecting.....	12 mos. 7	.....	.....	2,193,570	250,773	474,306	4,540	1,076,463	38,178	1,844,260	261,250
Montour.....	Dec. 57	48,073	218	48,499	12,974	31,974	945	14,833	6,909	67,635	1,464
Nashville, Chatt. & St. Louis.....	12 mos. 57	877,894	4,796	896,034	225,381	424,501	11,224	232,122	85,986	983,414	30,962
Nashville, Chatt. & St. Louis.....	Dec. 1,259	1,448,468	37,793	2,038,312	210,430	415,714	94,379	734,701	67,151	1,529,698	479,366
Nashville, Chatt. & St. Louis.....	12 mos. 1,259	17,317,770	4,834,798	24,000,050	3,486,474	5,213,623	946,124	8,567,232	851,251	19,185,096	4,814,954
Nevada Northern.....	Dec. 165	58,567	7,391	73,159	16,286	11,028	934	16,847	6,932	52,250	12,636
Newburgh & South Shore.....	12 mos. 165	841,000	105,096	1,028,415	216,956	93,225	11,459	200,513	68,934	592,685	314,250
Newburgh & South Shore.....	Dec. 7	.....	.....	20,155	16,544	40,688	.....	119,978	5,472	183,682	44,795
Newburgh & South Shore.....	12 mos. 7	.....	.....	2,086,098	255,422	468,348	.....	858,630	53,415	1,635,810	243,494
New Orleans Great Northern.....	Dec. 274	217,404	29,876	255,734	24,710	45,256	8,836	60,203	11,431	150,788	35,417
New York Central.....	12 mos. 274	2,470,079	333,382	2,905,044	409,700	512,303	79,960	861,230	127,374	1,977,763	519,428
New York Central.....	Dec. 6,922	20,354,079	8,397,911	33,094,485	5,288,442	7,750,950	424,360	12,077,922	1,027,058	26,966,872	4,195,477
New York Central.....	12 mos. 6,922	240,130,678	96,746,925	385,958,657	52,783,218	81,218,504	4,580,448	14,273,515	12,552,497	290,439,271	64,633,074
Cincinnati Northern.....	Dec. 244	459,546	8,913	465,510	28,105	54,982	6,583	153,833	11,528	252,943	121,337
Cleveland, Cin., Chic. & St. Louis.....	12 mos. 244	4,545,901	102,244	4,756,220	554,900	763,397	73,897	1,502,856	132,856	3,624,068	936,296
Cleveland, Cin., Chic. & St. Louis.....	Dec. 2,391	6,011,576	1,468,313	8,141,970	667,528	1,548,549	148,504	2,947,031	320,556	5,693,673	1,560,790
Cincinnati Northern.....	12 mos. 2,391	68,196,254	16,322,908	92,061,070	11,020,607	18,177,938	1,576,669	26,933,355	2,832,315	67,001,482	18,560,428
Indiana Harbor Belt.....	Dec. 116	.....	.....	875,111	79,576	162,131	5,269	410,703	25,216	682,663	75,188
Michigan Central.....	12 mos. 116	4,990,893	1,875,290	7,749,384	604,518	1,671,308	112,765	4,520,205	347,157	7,604,337	3,109,181
Michigan Central.....	Dec. 1,862	61,859,111	20,840,642	91,864,377	10,415,368	17,618,141	1,306,341	29,219,146	2,399,301	61,893,039	18,560,428
Pittsburgh & Lake Erie.....	Dec. 231	2,451,107	258,304	2,803,975	376,185	702,300	21,320	764,831	93,321	1,958,816	723,574
New York, Chicago & St. Louis.....	12 mos. 231	27,881,374	2,999,299	32,026,689	4,516,480	9,578,357	278,285	10,166,074	918,536	23,455,383	8,146,221
New York, Chicago & St. Louis.....	Dec. 1,695	4,332,256	161,805	4,652,993	635,730	974,041	123,000	1,661,536	139,374	3,336,497	962,344
New York, Chicago & St. Louis.....	12 mos. 1,695	50,801,367	1,947,553	54,670,917	7,301,034	10,168,327	1,457,460	19,065,039	2,399,301	41,893,039	9,589,635
N. Y., New Haven & Hartford.....	Dec. 1,918	5,442,944	4,373,554	11,246,745	1,276,989	2,404,523	68,942	4,142,207	304,083	8,748,485	1,915,798
Central New England.....	12 mos. 1,935	67,607,786	49,735,504	132,266,423	16,992,837	27,629,520	906,114	46,733,099	3,519,907	97,745,382	19,279,909
Central New England.....	Dec. 278	516,786	5,034	541,623	104,716	142,472	6,711	228,595	21,953	504,399	194,903
Central New England.....	12 mos. 287	7,076,721	93,808	7,407,229	1,447,573	1,436,894	76,308	2,439,907	190,814	5,590,531	1,720,775
New York Connecting.....	Dec. 20	213,455	.....	253,371	17,537	15,346	.....	60,789	1,361	95,033	188,444
New York, Ontario & Western.....	12 mos. 20	2,436,176	.....	2,782,340	238,211	154,999	610,754	1,020,446	1,361	95,033	188,444
New York, Ontario & Western.....	Dec. 569	263,792	97,073	514,310	139,226	136,926	15,026	372,526	63,711	691,648	63,326
New York, Ontario & Western.....	12 mos. 569	7,286,569	2,723,625	12,247,511	1,890,167	2,322,776	197,359	5,419,629	463,074	10,319,418	1,675,368
Norfolk & Western.....	Dec. 2,241	8,274,081	722,687	9,933,219	1,394,487	1,657,827	97,891	2,465,419	171,978	5,775,267	2,978,909
Norfolk & Western.....	12 mos. 2,240	93,370,357	8,031,229	105,218,991	15,109,848	21,655,957	1,190,440	28,140,127	2,084,550	67,934,816	31,510,952
Norfolk Southern.....	Dec. 931	638,738	98,308	796,062	72,750	107,002	24,931	303,231	28,357	536,271	178,861
Norfolk Southern.....	12 mos. 931	6,595,416	1,009,569	9,131,878	1,191,523	1,320,534	281,680	3,552,644	338,267	6,868,088	1,411,528
Northern Pacific.....	Dec. 6,682	6,272,858	1,093,207	9,169,012	487,236	1,613,326	150,285	2,743,750	256,213	5,328,068	2,375,714
Northern Pacific.....	12 mos. 6,693	76,301,308	13,201,179	97,864,555	12,759,150	17,603,304	2,073,155	33,338,234	2,980,307	69,972,077	19,861,077
Northwestern Pacific.....	Dec. 477	280,217	163,544	483,715	116,544	79,438	5,787	208,598	17,695	426,214	45,831
Northwestern Pacific.....	12 mos. 489	4,275,451	1,226,314	7,045,831	957,789	1,200,543	79,603	2,753,514	211,074	5,203,514	1,156,227

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925—CONTINUED

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net after income rents	Net after rents, 1924
		Freight	Passenger	Total	Way and structures	Equip. maint.	Traffic				
Pennsylvania R. R.	Dec. 10,500	\$39,778,392	\$12,242,194	\$57,834,173	\$8,009,262	\$14,482,463	\$734,801	81.2	\$10,861,134	\$8,815,004	\$7,878,468
	12 mos. 10,500	465,013,724	144,969,963	672,136,962	85,003,417	162,033,562	8,175,440	78.4	144,997,615	113,016,563	100,108,007
Baltimore, Chesapeake & Atlantic, Dec. 130	55,325	31,412	90,098	121,510	12,338	28,668	79,130	140.0	36,001	36,001	35,179
	12 mos. 130	963,952	438,498	1,402,450	160,455	355,981	24,135	103.6	53,087	53,340	54,814
Long Island	Dec. 397	759,652	1,770,590	2,530,242	590,242	607,976	25,496	89.5	278,568	184,304	220,188
	12 mos. 397	10,603,283	24,162,883	34,766,166	5,466,480	10,166,480	294,110	73.2	9,897,260	7,686,930	6,876,871
West Jersey & Seashore	Dec. 378	384,029	390,990	775,019	217,790	163,673	14,845	104.9	40,401	40,401	41,968
	12 mos. 378	4,899,369	7,788,129	12,687,498	2,261,366	2,223,481	232,254	81.1	2,538,213	1,521,468	1,178,305
Peoria & Pekin Union	Dec. 19	21,358	4,259	16,679	9,942	10,952	1,004	67.8	53,078	23,078	44,837
	12 mos. 19	293,737	34,578	328,315	189,476	184,155	10,512	75.5	457,833	217,833	504,366
Pere Marquette	Dec. 2263	3,148,236	349,517	3,769,291	336,445	811,210	55,084	70.3	1,118,131	930,613	810,681
	12 mos. 2263	35,503,610	4,275,248	42,778,858	4,850,274	9,104,647	640,320	71.9	11,985,434	9,902,429	8,770,220
Pittsburgh & Shawmut	Dec. 102	133,182	6,064	142,037	16,149	38,775	1,407	73.1	103,884	38,001	48,350
	12 mos. 102	1,248,310	48,483	1,324,498	174,049	399,666	16,771	79.5	1,053,461	249,776	339,241
Pittsburgh & West Virginia	Dec. 92	378,744	6,807	419,852	40,747	104,050	10,413	69.7	292,628	69,399	145,934
	12 mos. 92	4,368,373	82,333	4,850,706	457,529	1,112,568	82,806	61.1	1,889,114	1,328,869	2,111,160
Pittsburgh, Shawmut & Northern	Dec. 210	167,083	3,461	175,394	11,901	133,864	1,688	126.5	46,512	52,541	63,625
	12 mos. 210	1,813,432	39,522	1,901,898	317,275	530,875	21,500	85.6	27,931	238,181	146,904
Quincy, Omaha & Kansas City	Dec. 250	57,071	19,505	84,432	39,816	14,823	910	111.5	9,715	15,334	18,389
	12 mos. 250	724,224	196,644	1,010,855	392,530	167,526	10,254	108.2	82,635	139,251	176,274
Reading Company	Dec. 1,139	5,553,781	821,290	7,183,750	362,954	1,733,832	71,322	80.3	1,411,846	1,101,663	1,390,384
	12 mos. 1,139	77,243,914	9,881,422	91,496,379	12,055,882	20,381,954	862,634	75.0	22,862,864	18,507,480	20,354,629
Atlantic City	Dec. 161	119,001	127,835	261,295	61,764	31,690	3,385	108.9	23,229	56,770	80,856
	12 mos. 161	1,603,520	3,231,598	5,034,447	1,034,038	447,159	86,511	82.1	902,885	600,559	222,465
Perkiomen	Dec. 41	109,817	4,294	118,079	7,096	9,997	113	57.6	50,051	27,375	22,492
	12 mos. 41	1,287,999	70,335	1,402,134	113,244	77,904	1,299	55.1	628,963	549,444	486,938
Port Reading	Dec. 19	130,183	.....	172,415	21,283	4,182	229	58.6	71,457	40,245	4,832
	12 mos. 19	1,829,694	.....	2,496,231	286,028	106,302	2,748	49.3	1,264,545	1,060,173	314,719
Richmond, Fred'sburg & Potomac	Dec. 117	387,051	488,683	1,175,960	103,794	103,794	7,460	55.0	529,658	442,714	395,969
	12 mos. 117	5,885,602	4,699,140	12,891,177	1,312,560	1,875,860	105,472	63.3	4,736,136	3,947,994	3,277,685
Rutland	Dec. 413	3,877,222	1,064,998	5,084,138	74,512	114,383	10,068	85.7	72,706	51,300	60,321
	12 mos. 413	37,877,222	12,440,086	64,404,041	1,229,649	1,299,649	120,159	84.6	990,541	679,905	786,663
St. Louis-San Francisco	Dec. 4,986	5,717,144	1,550,521	7,874,023	939,911	1,448,222	109,404	68.6	2,468,661	2,071,641	1,921,262
	12 mos. 4,916	67,094,089	16,862,080	90,058,611	11,054,698	17,254,939	1,280,198	69.2	27,314,887	22,791,585	21,867,133
Ft. Worth & Rio Grande	Dec. 233	98,580	19,893	132,637	24,202	24,778	3,573	91.7	11,045	6,228	5,765
	12 mos. 233	1,044,629	228,315	1,399,498	310,804	273,584	38,613	96.3	151,151	1,681	115,632
St. Louis, San Francisco & Tex.	Dec. 137	192,331	11,969	212,908	25,152	30,268	5221	64.1	76,337	73,575	46,309
	12 mos. 137	1,971,407	154,989	2,204,156	345,173	339,371	60,845	71.6	626,083	595,817	296,988
St. Louis Southwestern	Dec. 940	1,416,932	162,154	1,673,800	236,443	246,208	58,657	60.8	655,465	560,623	480,007
	12 mos. 943	15,659,252	1,603,581	18,232,233	2,697,488	3,613,909	634,387	67.9	5,860,051	5,054,375	4,176,561
St. Louis Southwestern of Texas	Dec. 807	632,093	80,675	768,156	180,557	118,410	23,871	82.4	134,568	103,569	162,074
	12 mos. 807	6,434,300	883,363	7,990,029	1,929,402	1,890,422	279,141	95.6	346,353	10,108	592,530
San Antonio, Uvalde & Gulf	Dec. 318	75,038	27,136	114,880	9,874	16,440	4,524	74.1	29,710	27,691	16,376
	12 mos. 318	1,107,660	206,705	1,447,849	233,162	177,779	55,965	77.6	323,932	281,669	170,778
Seaboard Air Line	Dec. 3,910	4,080,030	1,644,794	6,104,301	765,818	931,921	257,447	68.0	1,954,376	1,531,952	1,168,607
	12 mos. 3,910	43,883,022	13,123,868	62,862,740	8,465,901	10,141,243	2,225,936	74.3	16,133,288	13,087,304	10,824,672
Southern Ry.	Dec. 6,883	9,419,902	3,029,553	13,588,279	1,355,740	2,126,127	308,222	64.2	4,861,788	3,970,213	3,404,750
	12 mos. 6,873	106,776,763	30,951,806	149,313,892	20,437,949	25,702,134	2,907,511	69.5	45,001,940	36,011,696	31,086,021
Alabama Great Southern	Dec. 318	692,541	187,457	942,536	46,933	127,414	20,753	43.3	534,318	437,878	446,504
	12 mos. 318	7,799,556	2,000,339	10,433,271	1,345,526	1,883,124	255,060	66.6	3,482,121	2,760,874	2,999,281
Cin., New Orleans & Tex. Pacific	Dec. 338	1,484,491	472,566	2,093,798	111,416	328,244	48,067	57.1	898,946	751,513	725,263
	12 mos. 338	17,574,392	4,557,823	23,433,243	2,768,505	4,046,283	527,880	62.2	8,858,977	7,514,170	7,328,954
Georgia Southern & Florida	Dec. 401	395,266	228,797	684,826	327	718,837	19,456	56.6	297,282	254,425	174,515
	12 mos. 401	4,272,032	1,932,617	6,449,302	712,096	874,845	167,316	65.4	2,333,223	1,956,291	1,398,991
New Orleans & Northwestern	Dec. 267	481,997	86,119	604,929	45,469	80,324	14,342	53.5	281,185	212,890	114,888
	12 mos. 267	4,746,473	963,689	6,122,253	745,604	922,820	150,110	61.1	2,799,126	1,721,739	1,465,491
Northern Alabama	Dec. 110	124,134	11,131	138,335	13,315	5,466	2,257	45.7	75,153	68,991	37,458
	12 mos. 110	1,421,499	121,771	1,580,416	270,786	59,625	27,388	54.9	712,761	635,753	291,723
Southern Pacific	Dec. 8,763	11,795,325	3,607,778	17,101,169	2,220,373	2,686,542	321,258	68.9	5,323,820	3,986,368	3,836,779
	12 mos. 8,726	148,483,728	42,676,902	210,374,317	27,939,836	33,215,865	3,836,986	70.7	61,667,682	44,146,498	40,956,896

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1925—(CONTINUED)

Name of road	Average mileage operated during period	Operating revenues			Operating expenses			General	Total	Operating ratio	Net from railway operation	Operating income (or loss)	Net after rents	Net after rents, 1924
		Freight	Passenger	Total (inc. misc.)	Maintenance of way and structures	Equip-ment	Traffic							
Atlantic Steamship Lines.....	Dec. 12 mos.	\$804,537	\$25,794	\$830,331	\$18,982	\$275,601	\$26,535	\$698,228	\$1,037,057	108.8	-\$85,490	\$58,118	\$57,855	-\$388,427
Galveston, Harrisburg & S. Antonio, Dec.	12 mos.	9,530,274	505,980	10,036,254	192,498	2,631,550	221,567	8,063,845	11,512,882	99.9	10,324	8,453	10,878	96,336
Houston & Texas Central.....	Dec. 12 mos.	1,956,551	488,598	2,445,149	396,044	97,254	55,130	1,589,871	1,589,871	60.3	1,046,452	686,332	654,469	262,958
Houston East & West Texas.....	Dec. 12 mos.	2,353,722	5,211,476	7,565,198	5,272,471	5,350,683	653,574	10,462,208	13,933,587	79.1	6,181,600	4,808,190	3,983,557	5,808,588
Louisiana Western.....	Dec. 12 mos.	272,881	92,506	365,387	189,917	196,688	27,611	429,417	895,742	66.8	445,310	339,961	290,229	588,180
Morgan's L. & T. R. & S. S. Co., Dec.	12 mos.	3,046,643	948,225	4,000,000	2,583,915	2,782,797	326,914	4,962,525	5,800,241	76.1	3,533,343	2,702,570	2,120,304	2,321,887
Texas & New Orleans.....	Dec. 12 mos.	652,008	1,496,210	2,148,218	85,622	143,797	23,933	366,621	1,224,512	64.5	95,420	786,291	55,900	22,488
Spokane, Portland & Seattle.....	Dec. 12 mos.	716,857	173,453	890,310	108,358	105,039	15,196	283,853	44,109	58.3	398,675	365,040	333,345	125,947
Tennessee Central.....	Dec. 12 mos.	221,545	430,645	652,190	1,760,323	2,306,870	169,687	3,848,972	416,259	76.9	2,562,318	2,174,374	1,765,903	368,924
Terminal Railroad Ass'n of St. L., Dec.	12 mos.	2,582,443	1,374,779	3,957,222	1,12,841	48,616	9,991	211,392	20,953	60.9	267,717	127,341	130,458	13,874
East St. Louis Connecting.....	Dec. 12 mos.	.....	.....	.....	4,397,711	112,841	1,024	158,536	8,231	60.9	267,717	127,341	130,458	13,874
St. L. Merchants Bridge Term., Dec.	12 mos.	.....	.....	.....	5,173,025	553,930	12,103	1,814,081	102,133	68.7	1,619,295	804,978	2,006,122	1,872,046
St. Louis Transfer Ry.....	Dec. 12 mos.	.....	.....	.....	198,096	14,667	324	73,139	2,559	53.2	92,803	86,174	65,456	89,296
Toledo, Peoria & Western.....	Dec. 12 mos.	.....	.....	.....	2,256,957	271,317	3,829	412,260	1,249	55.826	138,861	133,797	65,516	55,065
Trinity & Brazos Valley.....	Dec. 12 mos.	.....	.....	.....	131,029	60,131	2,159	69,483	7,065	102.3	2,983	2,983	7,452	20,894
Ulster & Delaware.....	Dec. 12 mos.	.....	.....	.....	1,617,067	466,664	26,424	825,886	83,567	104.1	65,731	155,789	236,939	71,740
Union R. R. of Penna.....	Dec. 12 mos.	.....	.....	.....	66,890	10,012	175	37,428	1,249	83.5	11,064	10,628	4,907	9,051
Union Pacific.....	Dec. 12 mos.	.....	.....	.....	770,120	129,626	2,063	412,260	19,356	82.0	138,861	133,797	65,516	55,065
Oregon Short Line.....	Dec. 12 mos.	.....	.....	.....	131,029	60,131	2,159	69,483	7,065	102.3	2,983	2,983	7,452	20,894
Oregon Wash. R. R. & Nav. Co., Dec.	12 mos.	.....	.....	.....	1,617,067	466,664	26,424	825,886	83,567	104.1	65,731	155,789	236,939	71,740
Los Angeles & Salt Lake.....	Dec. 12 mos.	.....	.....	.....	297,593	79,765	3,951	108,549	11,638	79.1	62,274	54,557	25,811	184,384
St. Joseph & Grand Island.....	Dec. 12 mos.	.....	.....	.....	2,652,732	768,864	49,088	1,129,217	140,171	98.7	33,929	60,691	36,263	99,706
Utah.....	Dec. 12 mos.	.....	.....	.....	64,001	7,982	1,416	39,144	672	93.3	4,308	4,292	4,507	20,429
Virginian.....	Dec. 12 mos.	.....	.....	.....	216,985	192,783	21,390	658,565	68,314	87.0	173,550	104,448	47,669	153,291
Wabash.....	Dec. 12 mos.	.....	.....	.....	874,565	106,848	161	419,770	14,155	89.5	91,739	65,840	97,555	66,613
Western Maryland.....	Dec. 12 mos.	.....	.....	.....	11,454,385	1,163,037	2,198	4,959,932	121,534	77.5	2,578,863	2,183,269	2,755,497	1,417,550
Western Pacific.....	Dec. 12 mos.	.....	.....	.....	8,944,913	935,035	1,600,005	2,569,816	274,400	67.2	2,934,028	2,368,635	2,186,656	2,131,368
Wheeling & Lake Erie.....	Dec. 12 mos.	.....	.....	.....	12,792,383	21,620,223	1,933,300	29,669,807	3,384,526	65.0	38,521,967	31,533,938	28,995,490	27,552,006
.....	Dec. 12 mos.	.....	.....	.....	354,560	518,800	50,211	953,176	107,485	64.0	1,151,614	857,566	798,813	403,886
.....	Dec. 12 mos.	.....	.....	.....	5,813,675	6,064,093	584,738	10,724,471	1,303,923	71.0	10,298,779	7,452,195	6,590,958	5,526,654
.....	Dec. 12 mos.	.....	.....	.....	285,902	362,700	67,726	888,615	102,749	75.7	555,932	384,209	293,536	262,379
.....	Dec. 12 mos.	.....	.....	.....	5,077,642	4,349,218	787,600	10,539,321	1,358,582	80.6	5,416,254	3,371,355	2,129,737	2,956,635
.....	Dec. 12 mos.	.....	.....	.....	472,048	433,146	67,417	704,709	57,096	83.8	347,821	220,164	131,313	135,339
.....	Dec. 12 mos.	.....	.....	.....	4,261,676	4,658,335	795,604	8,156,773	806,028	79.8	4,960,420	3,361,810	2,322,459	1,877,867
.....	Dec. 12 mos.	.....	.....	.....	37,311	523,631	3,029	113,535	12,006	60.4	133,541	77,798	67,263	14,589
.....	Dec. 12 mos.	.....	.....	.....	585,394	523,631	34,676	1,234,956	145,870	72.0	980,663	791,321	619,873	291,406
.....	Dec. 12 mos.	.....	.....	.....	20,442	31,467	461	36,666	8,286	60.2	64,415	54,474	55,478	67,961
.....	Dec. 12 mos.	.....	.....	.....	222,529	449,778	4,597	378,085	80,319	65.3	604,500	513,671	460,843	310,172
.....	Dec. 12 mos.	.....	.....	.....	181,145	339,246	13,920	370,515	43,007	61.7	584,757	484,741	617,062	386,159
.....	Dec. 12 mos.	.....	.....	.....	2,700,209	4,102,491	156,742	4,462,199	422,266	62.4	7,092,697	5,789,017	6,458,207	5,536,451
.....	Dec. 12 mos.	.....	.....	.....	427,287	989,565	154,261	2,303,756	157,785	63.0	2,328,583	1,898,462	1,519,233	897,069
.....	Dec. 12 mos.	.....	.....	.....	9,311,985	12,348,291	1,816,543	25,431,804	1,948,564	73.1	18,829,877	15,535,228	12,552,515	9,347,780
.....	Dec. 12 mos.	.....	.....	.....	221,465	519,376	34,222	550,651	45,976	78.8	37,077	300,304	331,413	325,576
.....	Dec. 12 mos.	.....	.....	.....	2,493,541	4,566,342	439,113	5,802,371	535,209	70.3	5,896,217	5,118,444	4,726,158	3,560,637
.....	Dec. 12 mos.	.....	.....	.....	144,907	201,814	37,249	418,643	40,517	70.4	353,647	263,065	382,907	196,681
.....	Dec. 12 mos.	.....	.....	.....	2,238,096	2,455,996	459,697	5,243,883	437,560	72.8	4,236,103	3,254,470	4,298,499	2,973,611
.....	Dec. 12 mos.	.....	.....	.....	160,715	413,805	39,645	504,186	51,321	75.0	389,627	284,255	296,280	145,888
.....	Dec. 12 mos.	.....	.....	.....	2,880,816	4,678,490	369,759	6,040,044	616,460	70.6	5,994,628	4,422,062	4,364,972	2,361,489

*Excluding construction expenses \$1.81.

Traffic News

The Southern Pacific has opened a ticket office at 31 West Jackson boulevard, Chicago.

The Canadian Pacific has moved its ticket and freight offices at Seattle, Wash., to 1320 Fourth avenue.

The Pennsylvania Railroad is to install apparatus at its Greenville piers, Jersey City, to transfer export grain by pneumatic tube direct from cars to barges. This apparatus will have capacity for loading 100,000 bushels in ten hours and will be electrically operated. In the barges the grain is floated to the ship's side.

Senator Willis of Ohio has introduced a bill in the Senate, S. 3069, to make unlawful any tariff filed with the Interstate Commerce Commission which contains any provision exempting or purporting to exempt any common carrier from the liability for loss or damage of grain shipped in bulk imposed by paragraph 11 of section 20 of the interstate commerce act.

The Interstate Commerce Commission has ordered investigation of a proposal of the Northern Pacific to discontinue daily train service and establish a tri-weekly service between Beach, N. D., and Ollie, Mont., and has assigned the case for hearing at Beach on March 3, before Examiner Rogers. The commission has received protests against the proposal from interested parties.

The Union Pacific has extended its scholarship awards to boys and girls from 14 to 21 years of age, to include students of vocational agriculture in high schools in any county served by the Union Pacific. Heretofore the scholarships have been limited to members of boys' and girls' clubs conducted under the direction of the various state university extension services in Utah, Idaho, Nebraska, Kansas, Colorado, Wyoming, Washington and Oregon.

The Great Lakes Regional Advisory Board held its 14th regular meeting at Jamestown, N. Y., on February 11, with a large attendance, and president L. G. Macomber in the chair. W. C. Kendall, speaking for the car service division, A. R. A., gave a review of the railroad situation. He predicts that the first half of 1926 will show better business than the first half of 1925. There is an ample surplus of cars. The situation in Florida is rapidly improving and the railroads there have a third greater capacity than they had in December. The different commodity committees presented cheerful reports, though the farmers have suffered considerably from frost. It was stated that a million bushels of apples had been frozen on the trees before they could be picked. Representatives of the principal railroads made brief statements of improvements in facilities which have been made since the last meeting. The meeting approved a proposal to hold the next meeting of the Board at Detroit, on May 13 and 14.

B. & M. Traffic Officers Released

United States Commissioner E. C. Jenney, at Boston, Mass., on February 9, refused to hold, for trial at Chicago, W. T. LaMoure and George H. Nicholson of the traffic department of the Boston & Maine, who were indicted some weeks ago on charges of conspiracy in connection with shipments of beer from Lawrence, Mass., to Chicago. The commissioner found that there was not sufficient evidence to establish probable guilt. John C. Reardon, railroad clerk at Lawrence, who also had been indicted, has died since the proceedings were begun.

New Record for Average Daily Car Mileage

According to reports compiled by the Bureau of Railway Economics, the daily average movement of freight cars during the year 1925 was 28.3 miles, the highest mark ever attained by the railroads of this country since the compilation of this information was started in 1917. This was an increase of 1½ miles over the average attained in 1924 and of ½ mile above that for 1923. It also was an increase of 3.4 miles above the average for 1920.

The average load per freight car in 1925 was 27 tons, the same

as that for 1924, but nine-tenths of a ton below that for 1923. Compared with 1920, the average for 1925 was a decrease of 2.3 tons.

Southwest Advisory Board Meeting

The eleventh regular meeting of the Southwest Shippers' Advisory Board will be held at Brownsville, Tex., on March 19 and 20. A special invitation written in Spanish is being sent to representatives of the industries and of the railroads in Mexico.

Passenger Service Established on

Kamloops-Kelowna Branch

Passenger service on the new Kamloops-Kelowna branch of the Canadian National was inaugurated on February 15. A Diesel electric car leaves Kamloops daily, except Sundays, on the arrival of the eastbound Continental Limited, and returns to Kamloops in time to connect with the westbound Continental Limited. A motor boat will be built at the Canadian National yards at Prince Rupert for service on the lower end of Okanagan Lake in connection with the Kamloops-Kelowna branch. The boat will be operated under contract with the Canadian National by the Okanagan Lake Boat Company and the Canadian National will construct a wharf at Kelowna for this service.

Minnesota Rate Case Taken to Federal Court

The case of the state of Minnesota against the Minneapolis & St. Louis, one of the five Minnesota roads under indictment by the Hennepin county district court for alleged violation of the state statute governing intrastate freight rates, has been transferred to the United States district court. On petition of W. H. Bremner, receiver of the Minneapolis & St. Louis, Judge J. W. Molyneux upheld the contention of the Minneapolis & St. Louis attorneys that Mr. Bremner, as the receiver appointed by a United States court, is an employee of that court. As such an employee, it was decided, he cannot be tried in any other court for violation of law, whether state or federal. The ruling decreed that the documents in the Minneapolis & St. Louis case be placed in the hands of the federal court on or before February 17.

Inquiry into Canadian Coal Traffic Costs

Instructions have been given to the Dominion Railway Board by the Canadian government for an immediate inquiry into and report to the government on the question of the cost of transportation of coal from the producing areas of Alberta, in the west, and of Nova Scotia and New Brunswick, in the east, to the consuming districts of Ontario and Quebec. The inquiry will be directed to the subject of transportation cost per ton in full capacity train-load quantities, and it is to show both inclusive and exclusive of overhead and superintendence and allowance for profit (a) from an operating standpoint and eliminating the costs that would have to be incurred by the railways in any event whether any additional coal movement takes place or not, and also exclusive of any operating profit thereon; and (b) exclusive of the said overhead and superintendence cost, but inclusive of a reasonable operating profit thereon.

Freight Traffic for December and Twelve Months

Freight traffic moved by the Class I railroads in December was the greatest for any December on record, according to reports compiled by the Bureau of Railway Economics, amounting to 37,868,884,000 net ton miles, an increase of 2,863,136,000 net ton miles or 8.2 per cent over that of December, 1924, and an increase of 4,442,207,000 net ton miles or 13.3 per cent over that of December, 1923. It also was an increase of 9.2 per cent over December, 1920. In the Eastern district in December, the increase was 8.5 per cent as compared with the same month in 1924; while in the Southern district it was 11 per cent, and in the western 6.6 per cent.

For the year 1925, the volume of freight traffic amounted to 456,264,967,000 net ton miles. This was the greatest freight traffic ever handled by the railroads in any one year with the exception of 1923 which exceeded the total for 1925 by 1,341,693,000 net ton miles or three-tenths of one per cent. Freight traffic in 1925 was an increase of 26,620,881,000 net ton miles or 6.2 per cent over 1924. It also was an increase of 1.7 per cent over 1920. In the Eastern

district, the total was 228,541,318,000 net ton miles, an increase of 6.9 per cent over 1924, while in the Southern it was 64,584,372,000 net ton miles, an increase of 9.9 per cent. In the Western district, the increase was 163,139,277,000 net ton miles or 3.8 per cent.

Plenty of Cars for Anthracite

The Bureau of Service, Interstate Commerce Commission, in anticipation of an increased demand for open-top cars, due to the ending of the anthracite coal strike, has made a survey of the open-top car situation and issued the following information:

The table which follows indicates the number of open-top cars owned by the roads serving the anthracite fields, the number of cars on line, and the number of such cars in bad order, as of January 15, 1926; the number of serviceable idle cars on the lines of such roads January 31, 1926, and the number of cars of anthracite loaded by these lines in the last week of January of last year:

Anthracite Roads	January 15, 1926		Bad order cars		Jan. 31, 1926, total surplus serviceable		Cars loaded with anthracite ended Jan. 30, 1925	
	Open top cars owned	Cars on line	Number	Per cent	1926, total surplus serviceable	Jan. 31, 1926, total surplus serviceable	ended Jan. 30, 1925	ended Jan. 30, 1925
D. L. & W.	11,419	12,156	447	3.7	3,984	5,122		
D. & H.	11,629	11,964	306	2.6	7,873	6,603		
Erle	24,003	25,833	1,998	7.7	7,509	3,014		
L. & N. E.	2,297	2,508	72	2.9	1,750	1,244		
Lehigh Vy.	16,803	16,821	1,307	7.8	6,500	5,088		
N. Y. O. & W.	3,711	3,291	326	9.9	1,457	969		
C.R.R. of N.J.	17,163	16,841	311	1.9	8,942	2,828		
Penna. System.	186,332	159,707	22,860	14.3	8,941	3,032		
Reading Co.	29,695	27,631	445	1.6	5,938	5,182		
Total.	303,052	276,752	28,072	10.1	52,894	33,082		
United States.	1,001,413	.....	71,903	7.4	92,412	33,082		

"From the foregoing," says the statement, "it will be seen that in the United States the total surplus of open-top cars on January 31, 1926, aggregated 92,412. The total surplus in the anthracite region, 52,894 cars, is 57 per cent of the aggregate for the United States. At this period last year the anthracite roads were loading about 34,000 cars of anthracite per week. For a period of six months, following the 1922 strike, the production of anthracite averaged about 38,500 carloads per week. There were seven weeks during that period in which production slightly exceeded 40,000 cars per week. With proper movement by carriers and prompt unloading by consignees, no coal car shortage should occur."

More Maritime Protest Against

C. N. R.'s Use of American Port

More vigorous protests against the manner in which the Maritime Provinces are said to be treated by the railways, especially the Canadian National, have been made in the Canadian Parliament by members from that region. One of the strongest came from Col. Thomas Cantley (Pictou, N. S.) who was for years prominently connected with coal and steel industries of Nova Scotia. In the course of a speech which occupied a considerable time on two successive sittings of the House Col. Cantley said:

"I fancy that every member of this House has seen day after day, during several past weeks, statements as to the volume of trade passing through Fort William and Port Arthur en route for Europe. During November last, Great Britain bought 24,095,814 bushels of Canadian grain. Of this quantity 18,610,104 bushels went via United States ports, and only 5,845,710 bushels through Canadian ports. During the four months, August to November last, 63,632,830 bushels of our wheat went out through United States ports and but 17,144,297 bushels through Canadian ports. The great bulk of Canadian grain exported was carried by United States railways, and shipped through United States ports, to their great profit and our corresponding loss. Why was such an enormous expenditure incurred in connection with the Transcontinental and Grand Trunk Pacific railways? Why deprive Canadian railway men and Canadian ocean port workers of the handling of Canadian products shipped abroad? Why continue to build up Portland and starve the Intercolonial railway and our Maritime ports? Why build elevators at Halifax and make no use of them? Why have railway officials write as to the pending disposal of the Portland Grand Trunk terminals when an election is in prospect and progress, and continue to expend money on and route grain through those terminals when the election is over; and now when winter is here suggest that perhaps a beggarly half million bushels may be shipped from Halifax some time, when nearly six millions went through Portland last month?"

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has re-opened its anthracite rate investigation insofar as it involves a proposed readjustment of rates from Pennsylvania to destinations in upper New York state.

Court News

Backing Engine Not Negligence

The New York Court of Appeals holds that the operation of a locomotive backwards is not negligence, and where a trackwalker was killed by such an engine running from 10 to 20 miles an hour through a heavy fog, the bell having been rung and the whistle blown, the jury should have been told that there was nothing in the direction of the movement to charge the company with fault.—*D'Aurio v. Long Island*, 240 (N. Y.) 241, 148 N. E. 333.

Excessive Damages

The Michigan Supreme Court holds that a verdict of \$15,166.66 to the widow and child of a brakeman, which, at 5 per cent would yield an income equal to deceased's average yearly earnings, and at the end of the widow's life expectancy be still intact, was excessive, since the loss to the widow and child could not approximate his earnings, for the expense of his own needs would have to be considered.—*Sipes v. M. C.* 231 (Mich.) 404, 204 N. W. 84.

Challenge of Talesman on Strike

Against Defendant Railroad

In an action by a Pullman passenger against a railroad company and the Pullman Company, for personal injuries, the Florida Supreme Court holds that a challenge for cause should be restrained as to a talesman on strike against the railroad company and members of whose shop craft worked for the Pullman Company and the railroad company.—*Seaboard Air Line v. Parks* (Fla.) 104 So. 587.

Owner of Vicious Dogs Cannot

Recover for Their Death

In an action for killing dogs on a track the Alabama Supreme Court holds that Ala. Code 5923, section 6072, prohibiting the ownership of a dog known to kill sheep, fowls or goats, and granting immunity to any person who kills it, destroys all property right in such dog, and on proof of the owner's knowledge of such fact, he cannot recover for its killing, negligently or intentionally.—*Alabama G. S.* (Ala.) 104 So. 222.

Federal Employers' Liability Act

The Michigan Supreme Court holds that a pipe fitter employed in repairing locomotives used in interstate commerce was within the federal Employers' Liability Act although he was injured while temporarily leaving the grounds to get something to eat.—*Sterner v. M. C.*, 231 (Mich.) 382, 204 N. W. 102.

The federal district court for southern New York holds that an employee of the Hudson & Manhattan clearing up debris prior to the completion of a stairway being built through a tube for use in permitting passengers or employees to reach the street in case of necessity was not engaged in interstate commerce; the stairway until completion not being connected with interstate commerce.—*Clemence v. Hudson & M.*, 8 Fed. (2d) 317.

The Alabama Supreme Court holds that a switchman, injured by a fall from an engine when returning to his work at moving cars engaged in interstate and intrastate commerce which he had left that morning when his engine became disabled, was not engaged in interstate commerce.—*Birmingham Belt v. Ellenboro* (Ala.) 104 So. 269.

Foreign Railway News

Venezuelan Line to Be Electrified

The La Guaira & Caracas, a 23-mile line in Venezuela owned by British capital, will be electrified, according to the Times (London). The journey over the railway now requires two hours and electrification will reduce this to an hour and a quarter. One motive for the improvement is prospective highway competition due to road improvement. The cost of the work is estimated at £130,000.

Rail Motor Cars on French Railroads

The relative economy of gasoline over coal as motive power, when traffic is light and infrequent, has induced various experiments in the use of motors on railroads in France, beginning in 1921 with a series of trials by the État Railway, according to Commercial Attaché Jones at Paris. In the first of these experiments an attempt was made to adapt the ordinary street auto-bus of Paris to use on railroads by a simple change of wheels. Later, specially constructed cars were ordered, and trials of these began in March, 1922.

Operations extending over 25,000 kilometers proved that motor traction is suited to certain conditions of traffic. The État ordered 10 cars, substituting an 85-horsepower engine for one of 60 horsepower employed in previous trials. These motors have been in operation since the beginning of 1925, and have covered almost 120,000 kilometers with no accidents other than minor breakdowns.

The equipment weighs 15 tons in running order. There is space for two tons of baggage and two second-class compartments for passengers. The engine can draw two 10-ton cars on easy grades, and one over steep ascents. The passenger capacity of each car is 50. The normal speed of trains is 50 kilometers an hour, the engine alone being able to reach 72 kilometers.

The degree to which this equipment may prove economical, as compared with steam equipment, is not yet fully proved, since the cars have not been in operation long enough to make possible a full estimate of upkeep and deterioration. The operation of the motor trains, it is estimated, costs about 2 francs per kilometer traveled, while the similar cost for steam locomotives is 5 francs.

Miscellaneous

The Department of Commerce has received the following reports from its agents in various parts of the world:

Purchases by all the Indian railways in 1924-25 amounted to 210,372,000 rupees, of which 86,622,000 rupees were direct imports, 37,046,000 rupees imported goods purchased in India, and 86,704,000 rupees, equipment of Indian manufacture or origin.

Co-ordination of repair facilities on the State railways of India will be investigated by an expert to be appointed by the government.

The South African railways will build locomotive boilers at its Bloemfontein shops to encourage local manufacture, according to press reports. Twenty-five new freight cars and 10 passenger coaches are now building at these shops, which have turned out a total of 275 freight cars and 109 coaches.

Railway construction to take place immediately in Spain includes the following: Madrid Belt line, Madrid-Burgos line, Cuenca-Utiel connection, Talavera-Guadalupe line; Zamora-Orense-Coruna line; Algeciras-Cadiz line, Puertollana-Cordoba line, Setenil-Jerez line; Trans-peninsular line, Baeza-Teruel-Lerida, connecting with the French system at St. Giron, across the Pyrenees. The total length of these projected lines is 1,600 kilometers.

The railway situation in Manchuria is temporarily easier with the resumption of traffic on the Chinese Eastern. Transportation on the Peking-Hankow Railway has been suspended owing to the northward movement of the forces of General Wu-Pei-Fu, and freight transport between Peking and Tientsin is chiefly by carts. Passenger trains are still running.

Equipment and Supplies

Locomotives

THE PACIFIC PORTLAND CEMENT COMPANY has ordered one Mikado type locomotive from the Baldwin Locomotive Works.

THE HAINESPORT MINING & TRANSFER COMPANY has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE CHICAGO, ROCK ISLAND & PACIFIC budget for 1926 includes the purchase of 10 Mikado type locomotives and 5 passenger locomotives.

Freight Cars

THE PERE MARQUETTE is inquiring for 350 automobile box cars.

THE MISSOURI PACIFIC is inquiring for 60 tank cars of 50 tons' capacity.

THE ILLINOIS CENTRAL is inquiring for 200 automobile furniture cars.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 500 hopper cars.

THE COLORADO & SOUTHERN is inquiring for 100 Rodger ballast cars of 50 tons' capacity.

THE GENERAL REFRACTORIES COMPANY has ordered 2 steel flat cars from the American Car & Foundry Company.

THE NORTHERN PACIFIC has authorized the purchase of 1,000 automobile cars 50 ft. long and of 50 tons' capacity and is now inquiring for 1,000 box cars.

THE ILLINOIS CENTRAL, according to a statement made by President C. H. Markham, will place orders for 2,300 freight cars within a few days. The company has issued inquiries for this equipment.

THE SOUTHERN RAILWAY is inquiring for 1,000 box cars with steel center sills, of 40 tons' capacity, 1,000 steel frame hopper cars of 50 tons' capacity and 250 convertible ballast cars of 50 tons' capacity.

THE SEABOARD AIR LINE has ordered 1,000 box cars and 800 gondola cars from the Pressed Steel Car Company, 800 gondola cars from the Standard Steel Car Company and 800 gondola cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of January 30.

Passenger Cars

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 5 baggage cars.

ESTRADO DE FERRO MARICA (Brazil) is inquiring through the car-builders for 10 passenger cars.

THE MISSOURI & NORTH ARKANSAS has ordered a gasoline rail motor car equipment from the J. G. Brill Company.

THE CHICAGO, NORTH SHORE & MILWAUKEE has ordered 20 passenger cars and 3 dining cars from the Cincinnati Car Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 9 dining cars, 9 lounge cars and 5 cafe observation cars from the Pullman Car & Manufacturing Corporation.

THE SOUTHERN RAILWAY has ordered 55 passenger cars from the Pullman Car & Manufacturing Corporation. This item has not as yet been officially confirmed.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered one power plant equipment for converting existing equipment to motor cars, from the Electro-Motive Company.

THE CANADIAN NATIONAL has ordered two gas-electric power plant equipments to convert existing equipment on its line to motor cars, from the Electro-Motive Company.

THE NORTHERN PACIFIC has ordered three gas-electric rail motor cars of the 70-ft. type equipped with railway post office, passenger and baggage compartment, from the Electro-Motive Company.

THE SOUTHERN PACIFIC is now inquiring for 10 steel coaches, 6 steel combination baggage and postal cars and 28 steel baggage cars. In the *Railway Age* of January 30, mention was made that this company contemplated going into the market for 40 steel passenger cars.

Motor Vehicles

THE NORTHLAND TRANSPORTATION COMPANY, the bus operating subsidiary of the Great Northern, has ordered two 25-passenger city type Mack buses.

THE SOUTHERN has ordered through the Knoxville, Tenn., branch of the International Motor Company two 29-passenger city type Mack buses. The vehicles will be used to transport employees between Knoxville and the John Sevier terminal, about 8 miles distant.

Iron and Steel

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 1,000 tons of steel for 1926 requirements and has ordered 1,400 tons of steel for a bridge at Owego, N. Y., from the American Bridge Company.

Machinery and Tools

SWIFT & Co. has ordered a Bignall & Keller duplex pipe machine from Manning, Maxwell & Moore, Inc.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for two drilling machines and three frog and switch planers.

THE NEW YORK CENTRAL has ordered a Bridgeport heavy duty face grinder from Manning, Maxwell & Moore, Inc.

THE DELAWARE, LACKAWANNA & WESTERN has ordered a heavy duty gap lathe from Manning, Maxwell & Moore, Inc.

THE LOUISVILLE & NASHVILLE has ordered two Monarch helical geared ball bearing lathes from Manning, Maxwell & Moore, Inc.

Signaling

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company three 12-way electro-pneumatic pushbutton machines for Altoona, Pa.

THE NEW YORK CENTRAL has ordered from the Union Switch & Signal Company 290 color light signals, 1450 d.c. relays, 115 transformer relays, 750 circuit controllers and other apparatus for installation on various divisions east of Buffalo.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS, for the automatic signaling work, of which notice was given in this column on February 6, page 407, has ordered from the Union Switch & Signal Company, 185 color-light signals, 777 d.c. relays, and other necessary apparatus.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered from the Union Switch & Signal Company 74 three-color Style "TR" color light signals, 285 d.c. relays, and 70 "DNL" relays for approach lighting of these signals, all for use between Bellefontaine, Ohio, and Marion; also 24 Style "TR" color light signals for installation between Quincy and Bellefontaine.

THE ST. LOUIS-SAN FRANCISCO has ordered from the National Safety Appliance Company 110 track magnets necessary to complete its second division installation of automatic train control between Monett, Mo., and Afton, Okla. When this installation is finished a complete automatic train control system will be in service between Springfield, Mo., and Afton, Okla., 110 miles.

Supply Trade News

W. B. Causey, formerly city manager of Norfolk, Va., has been elected vice-president of the M. E. White Company, with headquarters in Chicago.

Harry B. Pflaster, sales engineer of the Hazard Manufacturing Company, with headquarters in Chicago, has resigned to engage in other business.

The Ohio Injector Company, Wadsworth, Ohio, has established a branch office at 30 National building, Cleveland, Ohio, and has appointed F. L. Dalzell district sales manager.

R. M. Thomas and Donald Charlton have been appointed technical representatives of the Reading Iron Company, Reading, Pa.

The technical department, which they head, is a newly created service division in the sales department. About all their time will be given over to railroad work and they will be required to give technical and practical counsel to any railroad which has pipe, engine-bolt, staybolt and boiler tube problems. R. M. Thomas, for the past four years has been associated with the Chicago office of the Reading Iron Company. He received his technical training at Cornell University and Carnegie Institute of Technology, and is a member of the American Institute of Mining and Metallurgical Engineers and the Western Society of Engineers.

Mr. Thomas will represent the Reading Iron Company in offices of various railroad systems of the West. His headquarters will be at 449 Conway building, Chicago, Ill. Donald Charlton has been for the past six years in the manufacturing division of the Reading Iron Company, the last two and one-half years of which he served in the capacity of assistant engineer of tests. His duties during this period required an intimate knowledge of railroad work. Mr. Charlton will call on eastern railroads and will have his

headquarters in the general office of the Reading Iron Company, Reading, Pa.

C. L. Sidle, salesman in the industrial water softener department of the Wayne Tank & Pump Co., Ft. Wayne, Ind., has been promoted to sales manager of that division, to succeed E. L. Horiskey, resigned.

The Chicago Steel Car Company, Harvey, Ill., has changed its name to the Gibson Car & Manufacturing Company. R. A. Pascoe, secretary of the Whiting Corporation, has also been



R. M. Thomas



Donald Charlton

appointed secretary-treasurer of the Gibson Car & Manufacturing Company, and **T. S. Hammond**, president of the Whiting Corporation, has been appointed vice-president of the Gibson Car & Manufacturing Company.

Herman Steinkraus now represents the **Bridgeport Brass Company**, Bridgeport, Conn., in the Cleveland, Ohio, territory. Mr. Steinkraus has charge of the Bridgeport Brass Company's Cleveland warehouse service as well as sales.

W. S. Marvin, formerly manager of railway sales of the French Battery Company, has been appointed vice-president and assistant general manager of the **Metal Ware Corporation**, Two Rivers, Wisconsin, with headquarters in Chicago, Illinois.

Benjamin F. Brown, who has been elected president of the **Brown-Lindsay Paint Company**, Chicago, was born in Davenport, Ia., in 1880, where he attended the public school. In 1908 he entered the employ of the **Riverside Paint Company** as production manager and later became a salesman, which position he held until 1915. From the latter date until 1923 he has been in the employ of the **Frank S. Lewis Varnish Company** which absorbed the **Riverside Paint Company**. In 1923 he became vice-president and manager of railway sales of the **Otley Paint Manufacturing Company**, Chicago, which position he held until he resigned to organize the **Brown-Lindsay Paint Company**. **M. G. Lindsay**, secretary of the **Brown-Lindsay Paint Company**, was born in Iowa City, Iowa, in 1897, and graduated from the **State University of Iowa** in 1918. In the same year he entered the employ of the **Chicago Varnish Company** in the railway and industrial department, where he remained until 1920. On the latter date he entered the employ of the **Otley Paint Manufacturing Company** as secretary and railway salesman, which position he held until his resignation to organize the **Brown-Lindsay Paint Company**.

L. G. Otley has been appointed vice-president of the **Otley Paint Manufacturing Company**, to succeed **B. F. Brown**, resigned. **H. Okin**, counsel, has been appointed secretary, to succeed **M. G. Lindsay**, resigned. **A. M. Anda**, accountant, has been promoted to assistant treasurer.

A. H. Purdom, formerly connected with the railroad department of **Johns-Manville, Incorporated**, Chicago, Illinois, has resigned to take a position in the railway department of the **Wood Conversion Company**, 310 South Michigan avenue, Chicago, manufacturers of refrigerator and passenger car insulations.

The **Twentieth Century Gravity Lubricator Company** has

been incorporated, with headquarters at 21 Kolb avenue (Belmar), Baltimore, Md. **W. E. Crist** is president and treasurer; **C. W. MacQueston**, vice-president and **S. S. Crist**, vice-president and secretary. The company was organized to manufacture oil cup lubricators for journal boxes.

E. T. McCleary, assistant vice-president in charge of operation of the **Youngstown Sheet & Tube Company**, Youngstown, O., has been promoted to vice-president in charge of operations. He graduated from the chemical and metallurgical course of the **Pennsylvania State College** in 1901. While attending school he was employed by the **Pennsylvania Steel Company** and the **Mountain Copper Company** on chemical work. After graduation he became associated with the **Pennsylvania Steel Company** and later with the Ohio works of the **National Steel Company** at Youngstown, O. Later he entered the employ of the **Carnegie Steel Company** and remained with that company until 1905, when he became chief chemist and metallurgist of the **Youngstown Sheet & Tube Company**. He held this position until 1908 when he was promoted to assistant superintendent of the blast furnace and steel department, which position he held until 1912. On the latter date he was promoted to assistant general superintendent and in 1923 was promoted to district manager in charge of all eastern plants of the company. He held the latter position until 1925, when he was promoted to assistant vice-president in charge of all operations, which position he held until his recent promotion.

J. F. Fierke, president of the **Illinois Iron & Bolt Company**, Carpentersville, Ill., has also been elected president of the **Chicago Railway Signal & Supply Company**, Chicago, succeeding **E. W. Vogel**, who has resigned to engage in other business.

Charles O. Poor, president of the **P. & M. Company, Ltd.**, Montreal, Que., and formerly president of the **General Railway Signal Company of Canada, Ltd.**, has been appointed vice-president and manager of the **Chicago Railway Signal & Supply Company**, with headquarters in Chicago. Mr. Poor was born at Solon, N. Y., and graduated from the **Port Chester, New York, high school**. He first entered signal work with the **Hall Signal Company** in its Chicago office, and later was superintendent of the manufacturing plant at **Garwood, N. J.** Mr. Poor left the **Hall Signal Company** in 1905 to become works manager for the **General Railway Signal Company** at **Rochester, N. Y.** In 1911 he was promoted to assistant resident manager, sales department, at Chicago, and in 1916 was again promoted to manager of the munitions plant of the **General Railway Signal Company** at **Rochester, N. Y.**, where he was in charge of the manufacture of 9.2 in. shells for the British government. In 1917 he was made president of the **General Railway Signal**



B. F. Brown



M. G. Lindsay



E. T. McCleary



Chas. Poor

Company of Canada, Ltd., with headquarters at Montreal, Que., which position he held until 1921, when he resigned to accept the position of operating executive with George W. Goethals & Co., New York. In 1923 he was made president of The P. & M. Company, Ltd., with headquarters at Montreal, which position he now holds. Mr. Poor will assume his new duties April 1.

At the organization meeting of the board of directors of the J. G. Brill Company, in Philadelphia, Pa., on February 11, the following officers were elected: **Samuel M. Curwen**, president; **J. W. Rawle**, vice-president; **E. P. Rawle**, treasurer and **Ed L. Oerter**, secretary. **H. W. Wolff**, vice-president of the American Car & Foundry Motors Company, was elected a director to fill the unexpired term of Stephen J. Simon, resigned. The present personnel of the board is as follows: **Samuel M. Curwen**, **E. P. Rawle**, **Francis A. Lewis**, **William Clarke Mason**, **W. H. Woodin**, **W. M. Hager**, **C. S. Sale**, **W. C. Dickerman** and **H. W. Wolff**.

R. H. Laverie & Sons, Inc., New York, inspection and testing engineers, are now affiliated with the new firm of **Charles Warnock & Co., Limited**, of Canada. Work booked by the Laverie Company for execution in Canada will be cared for by the Warnock Company, and Warnock orders booked in Canada for execution in the United States and Europe will be executed by Laverie in the United States, and the Bureau Veritas in Europe. **R. H. Laverie & Sons, Inc.**, are sole representatives of the Bureau Veritas in the United States and Canada. **Charles Warnock**, president of the newly incorporated firm of Charles Warnock & Co., Limited, Montreal, was born at Fort William, Ontario, on November 9, 1873. He was educated at Lake Forest University near Chicago, and later was employed by the Illinois Steel Company and other metallurgical firms for a period of eight years. In 1902, he joined the staff of Robert W. Hunt & Co., in the United States. A year later he was sent to Montreal as the company's first Canadian representative. He opened the Hunt Company's office in Montreal as manager, and on the death of Thomas Irving, became vice-president and general manager of Robert W. Hunt & Co., Ltd. On the death of Captain Hunt in 1923, Mr. Warnock was elected president of that company, which office he recently resigned to form his own inspection and testing company. **H. W. Greene** is associated with Mr. Warnock in the new company. Mr. Greene recently resigned as secretary of Robert W. Hunt & Co., Ltd., and is now vice-president and treasurer of Charles Warnock & Co., Ltd. He was on the staff of Robert W. Hunt & Co., Ltd., for six years. Prior to that, he was in the auditing department of the Canadian Pacific and was purchasing agent of the St. Lawrence Bridge Co., Ltd.



Chas. Warnock

The South Chicago forgings plant of the **Pollak Steel Company** has been merged with the **Standard Forgings Company** of Chicago. The active management and operation of the South Chicago plant will be under the supervision of the officers of the Standard Forgings Company but the operating personnel of the South Chicago plant will be unchanged. The South Chicago plant will be operated as the South Chicago drop forge department of the Standard Forgings Company. The Pollak Steel Company will retain an interest in the merged companies, although the active management of the South Chicago and Indiana Harbor plants will be under the direction of the present officers of the Standard Forgings Company, Chicago.

Lima Locomotive Works

The annual report of the Lima Locomotive Works for the year ended December 31, 1925, shows a loss from the year's operations of \$844,392 as compared with a profit before federal income tax allowances in 1924 of \$1,725,043. This result came about through a reduction in sales to \$4,490,028 in 1925 from sales in 1924 of \$14,577,136.

Joel S. Coffin, chairman of the board, in his remarks to stockholders gives further details as follows:

The gross sales for the year amounted to \$4,490,028, and other income \$205,674, making the gross income \$4,695,703, compared with \$14,793,442 for the year 1924 and with \$20,397,636 for the year 1923. The sales for the year equaled less than one-third of that of the previous year and less than one-fourth of that of the year 1923. This sharp reduction in sales resulted in a deficit, after depreciation, of \$844,392.

The company has neither bonded debt nor preferred stock. Regular quarterly dividends of \$1.00 per share on the outstanding 211,057 shares of common stock without par value, amounting to \$844,228, were declared from surplus and paid during the year.

The surplus on January 1, 1925, was \$4,671,692. After deducting the deficit of \$844,392, and dividends paid of \$844,228, a total of \$1,688,620, the surplus on December 31, 1925, was \$2,983,072.

The current assets at the close of the year were \$7,400,775 and the current liabilities \$1,359,242, indicating an excess of \$6,041,533 in current assets over current liabilities. Included in current assets are \$3,800,672 in cash and United States Treasury Certificates and Liberty Bonds.

The inventory of materials and supplies and work in progress, amounting to \$2,547,655, has been priced at cost or market value, whichever was lower.

The deduction for depreciation on plant and property amounted to \$419,222, compared with \$415,719 for the year 1924.

During the latter part of the year the demand for locomotives increased materially, and on December 31, 1925, the unfilled orders on the books amounted to \$6,900,232, or more than one and one-half times the gross sales during the year 1925.

The comparative income statement follows:

LIMA LOCOMOTIVE WORKS			
Income Account			
	1925	1924	
Sales	\$4,490,028	\$14,577,136	
Less: Manufacturing cost:			
Administrative and other expense....	5,120,873		
Depreciation	419,222		
Total	\$5,540,095	\$13,068,399	
Operating profit	Loss \$1,050,067	\$1,508,736	
Other income	205,675	216,307	
Profit		\$1,725,043	
Less reserve for federal income tax.....		225,000	
Net income	Loss \$844,392	\$1,500,043	

Baldwin Locomotive Works

The annual report of the Baldwin Locomotive Works for the year ended December 31, 1925, issued on February 16, shows net profit for the year's operations of but \$196,564 as compared with \$1,920,027 in 1924 and \$11,931,522 in 1923. The 1925 net was equivalent to but 98 cents a share on the \$20,000,000 outstanding preferred stock. In 1924 the company set aside \$600,000 for depreciation. The balance remaining was equivalent to \$6.60 a share on the preferred stock. This means that in two years in succession, the company has failed to earn its 7 per cent preferred dividends and has earned nothing on its common. The full 7 per cent dividends, totaling \$2,800,000 have been paid on both issues, the 1925 dividends having been paid from surplus in 1924 and an adjustment having been made in the surplus as of December 31, 1925, to cover the 1926 dividend requirements.

The sales in 1925 totaled \$27,876,064 as compared with \$26,080,352 in 1924 and with average annual sales for the past 14½ years of about \$55,000,000. There was in 1925 a manufacturing loss of \$2,359,625 and in 1924 of \$356,820. In 1925 the company received \$3,373,263 in other income which after the deduction of other expenses left the profit for the year of \$196,564.

The following is a comparison of the income account for 1925 with that of 1924.

BALDWIN LOCOMOTIVE WORKS			
	Year 1925	Year 1924	
Sales	\$27,876,064	\$26,080,352	
Cost	30,235,690	26,437,172	
Manufacturing loss.....	\$2,359,625	\$356,820	
Other income	3,373,263	3,256,255	
Gross profit	\$1,013,637	\$2,899,435	
Deduct other expenses, etc.....	817,073	979,408	
Profit	\$196,564	\$1,920,027	
Less reserves:			
For depreciation		600,000	
Net cash profit to surplus.....	\$196,564	\$1,320,027	

President S. M. Vauclain in his statement to stockholders says: "Throughout the year difficulty was experienced in obtaining, at

any price, sufficient business to operate our workshops and maintain an irreducible minimum organization. Trade relations with foreign countries were sustained and improved. Workshops and machinery have been fully maintained and the transfer of equipment and operations from our works in Philadelphia to Eddystone continued. Your management considers the outlook favorable for a satisfactory business throughout the year 1926."

The general balance sheet as of December 31, 1925, showed current assets of \$40,580,660 and current liabilities of \$7,031,049. The current assets included \$8,037,934 inventory, \$8,798,474 accounts receivable, \$2,862,050 bills receivable, \$2,263,292 cash, and the balance was made up of domestic and foreign securities. Current liabilities included \$3,371,201 accounts payable, \$2,000,000 bills payable, and \$1,659,848 depositors saving fund.

The company's holdings of Republic of Poland Bonds were reduced from \$4,860,000 at the close of 1924, to \$3,890,000 at the close of 1925; Rumanian treasury bonds were reduced from \$1,226,457 to \$976,751; Argentine State Railway notes were the same at \$7,107,850; Mexican Government Railway notes decreased from \$3,758,337 to \$1,860,793. The Chinese Government for the account of the Kinhan Railway owes \$1,485,000, and Republic of Colombia notes were reduced from \$312,176 to \$267,644.

The profit and loss surplus on December 31, 1925, after the adjustment to cover the 1926 dividends, amounted to \$15,763,832, against \$18,367,269 at the close of 1924.

J. G. Brill Company

The J. G. Brill Company annual report for 1925 shows a balance after allowance for state and federal taxes of \$571,269 as compared with \$577,761 in 1924. Samuel M. Curwen, president, in his annual report gives details of the year's operations as follows:

For the year 1925, the combined output of your company's four plants amounted in sales value to \$9,101,910.

The combined output for each of the past seven years follows:

1919.....	\$14,210,622
1920.....	17,537,293
1921.....	7,647,899
1922.....	10,177,583
1923.....	18,167,486
1924.....	8,721,727
1925.....	9,101,910

After deducting from earnings all cost of operations, including maintenance and repairs and depreciation for the year amounting to \$560,939 and after setting aside out of earnings reserve for federal income taxes, not yet due, of \$82,791, the result of the operations of all the plants of your company shows a net profit for the year of \$571,269.

The amount of work on hand February 1, 1926, was approximately \$4,500,000 compared with \$4,521,000 at this time last year.

During the past year your company has continued the active development of various sizes of gasoline and gas-electric self-propelled cars for steam railroads. The development cost of this new product during the year ending December 31, 1925, has amounted to approximately \$350,000, all of which, in accordance with the conservative policy of your management, has been charged against the profits for the year. This new branch of your company's business is increasing. More than 55 steam railroads have these cars either in operation or on order, and much interest in this equipment is being shown by railroad officials.

On January 8th, I mailed a letter to all of the stockholders of this company outlining the plan and proposal for the reorganization of your company. On January 13 a sufficient amount of stock had been deposited to make the plan operative and, accordingly, the Brill Corporation has been incorporated under the laws of Delaware. At this time more than 90 per cent of the stock of the J. G. Brill Company has been deposited under the plan.

At a meeting of your Board of Directors held January 29, 1926, W. H. Woodin, president of the American Car & Foundry Company, was elected a director to fill the unexpired term of Wm. H. Heulings, Jr., deceased.

At the stockholders meeting on February 10, W. M. Hager, Wm. Clarke Mason and C. S. Sale were elected directors to serve three years and W. C. Dickerman to serve one year.

Obituary

James Harrison Whitner, vice-president of the Virginia Bridge & Iron Company, died at Roanoke, Va., on February 10. Mr. Whitner was born in Anderson, S. C., on August 15, 1861, and was graduated from the Rensselaer Polytechnic Institute in 1885. He had been associated with the Virginia Bridge & Iron Company since 1898, first in charge of its Southern contracting office at Birmingham, and for more than 20 years in charge of the company's contracting department at Roanoke. For the past eight years he had been vice-president in charge of contracting.

Railway Construction

ATLANTIC COAST LINE.—This company is planning the construction of a station at Walterboro, S. C.

BOSTON & ALBANY.—A contract has been awarded to the Fredenneck-Billings Company, Boston, for the construction of track canopies and platforms at Springfield, Mass., to cost approximately \$110,000.

BOSTON & ALBANY.—This company has awarded a contract to the New England Construction Company, Springfield, Mass., for the construction of a new third main track from Warren, Mass., to West Warren (4 miles) at an approximate cost of \$250,000. The work includes one bridge, nine culverts, ½ mile of concrete crib retaining wall and 100,000 cu. yd. of excavation.

CANADIAN NATIONAL.—The construction of a passenger station at Kamloops, B. C., is contemplated.

CENTRAL OF GEORGIA.—This company is contemplating the construction of a new yard office at Albany, Ga.

CENTRAL OF NEW JERSEY.—This company has awarded a contract to the Great Lakes Dredge & Dock Company for dredging between Piers 6 and 7, Jersey City; estimated expenditure, \$45,200.

CHESAPEAKE & OHIO.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from a point near Edwight to Surveyor, W. Va., 19.5 miles.

CHICAGO & NORTH WESTERN.—The construction of a three-stall enginehouse and mechanical coal chute at Jewell, Ia., is contemplated.

CHICAGO, ROCK ISLAND & PACIFIC.—A contract has been awarded to the Railroad Water & Coal Handling Company, Chicago, for the construction of a 300-ton frame coaling station at Enid, Okla.

CHICAGO, ROCK ISLAND & PACIFIC.—The construction of the following has been authorized: A cut-off from Homestead, Okla., to Okeene, a distance of approximately 10 miles; extension of roundhouse and terminal at Burr Oak, Ill.; track elevation in Chicago and Oklahoma City, Okla.; and seven coaling stations, 12 cinder pits, 4 water washout plants and 14 water treating plants.

EL DORADO & WESSON.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Edgar to Lisbon, Ark., 12 miles, with a 3-mile branch.

GREAT NORTHERN.—The reconstruction of a dock at Seattle, Wash., which was partially destroyed by fire last summer, has begun. The cost of the work is estimated at \$50,000.

GULF, COLORADO & SANTA FE.—Bids for the construction of several shop buildings at Cleburne, Tex., are being received.

ILLINOIS CENTRAL.—Bids are being received for the construction of a water station and the digging of a well at Osage, Ia.

ILLINOIS CENTRAL.—A temporary suburban station will be constructed at once on a site east of the present station at Randolph and South Water streets, Chicago. As soon as the temporary station is put into operation the present station will be removed and the site will be occupied by the permanent suburban station. The construction planned for the immediate future will cost approximately \$2,400,000.

MISSOURI-KANSAS-TEXAS.—Company forces will construct extensions to the yard tracks at Parsons, Kan., at a cost of \$52,000. Bids will be received for the replacement of 670 lineal feet of open deck trestle bridges with concrete bridges on various divisions on the Northern lines at a cost of \$45,000, and for the replacement of 1,705 lineal feet of open deck trestle bridges with concrete bridges on various divisions on the lines in Texas at a cost of \$100,000.

MISSOURI PACIFIC.—A contract has been awarded to the List Construction Company, Kansas City, Mo., for the construction of 19 miles of second track between Washington, Mo., and Jefferson, and another contract has been awarded to Winston Brothers Company, Minneapolis, Minn., for the construction of 3¼ miles of second track along the same line. The total cost of the 22¼ miles of second track is estimated at \$2,954,000. Contracts have been awarded to the Ogle Construction Company, Chicago, for the construction of concrete coaling stations at Archie, Mo., and Centerview, each to cost \$45,000. A contract has been awarded to the Folwell-Ahlskog Company, Chicago, for the construction of a work house for the grain elevator at Kansas City, Mo., to cost \$550,000. A contract has been awarded to the Pittsburgh-Des Moines Steel Company, Des Moines, Ia., for the erection of a steel water tank and the laying of pipe lines at Jefferson City, Mo., at a cost of \$30,000. A contract has been awarded to Frankman Brothers Bridge & Construction Co., St. Louis, Mo., for the installation of a truss span and the protection of new piers for a bridge at Kragen, Ark., at a cost of \$138,000.

NAPLES, SEABOARD & GULF.—The Interstate Commerce Commission has extended until March 5 the time when this company must begin the construction of its new line in Florida.

NEW YORK, NEW HAVEN & HARTFORD.—This company has authorized the widening of No. 1 platform at its Cedar Hill (New Haven, Conn.) transfer at an estimated cost of \$60,000.

NEW YORK, PITTSBURGH & CHICAGO.—The Interstate Commerce Commission has re-opened for further hearing the proceedings on the application of this company for a certificate for the construction of the new line across Pennsylvania from Allegheny, Pa., to Easton.

PENNSYLVANIA.—Contracts have been awarded to the T. J. Foley Construction Company, Pittsburgh, Pa., for the following work: New yards and buildings at Altoona, estimated cost, \$465,000; a coal dock at Wierton, W. Va., estimated cost, \$60,000; a scrap dock at Rochester, Pa., estimated cost, \$60,000; and a bridge at Hollidaysburg, Pa., estimated cost, \$50,000.

PENNSYLVANIA.—Work will soon be started to carry out the first step of an improvement program designed to effect an extensive increase in the capacity of the yards of this company on its main line at East Altoona, Pa. The initial step includes replacing the present track scales with two of the "plate fulcrum" type, each 62 ft. in length; also the building of a mechanical hump and general revision of the eastern classification yard. It is estimated that these changes will permit the handling of approximately 300 more cars a day than at present. The ultimate scope of the program involves consolidation of the two present classification yards, and various other improvements, which will increase the combined capacity of the receiving and classification yards from 3,492 cars, as heretofore, to 4,589 cars.

SACRAMENTO NORTHERN.—The Interstate Commerce Commission has authorized this company to acquire trackage rights over the San Francisco-Sacramento Railroad from West Sacramento, Cal., to Lisbon, 8 miles, and to construct a 13-mile extension southward from Lisbon.

SOUTHERN.—Bids are being received for the construction of a freight depot at Anniston, Ala.

SOUTHERN PACIFIC.—Plans are being prepared for the construction of an 18-stall roundhouse and a machine shop at Eugene, Ore.

SOUTHERN PACIFIC.—A contract has been awarded to Bent Brothers, Stockton, Cal., for the construction of a concrete fuel oil tank at Tracy, Cal. The tank will be 1,300 ft. long and 600 ft. wide and will hold approximately 3,000,000 barrels of oil.

ST. LOUIS-SAN FRANCISCO.—Bids are being received for the construction of a freight depot at Springfield, Mo.

UNION PACIFIC.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension of a branch line 10 miles southerly from a point near Yoder, Wyo.

WABASH.—Bids are being received for the construction of a passenger station at Granite City, Ill.

Railway Financial News

AKRON UNION PASSENGER DEPOT.—*Final Value.*—The Interstate Commerce Commission has placed the final value for rate-making purposes as of 1916 at \$401,713.

AMERICAN RAILWAY EXPRESS COMPANY.—*New Director.*—Frederick H. Ecker, vice-president of the Metropolitan Life Insurance Company, has been elected a director to fill a vacancy.

ATLANTIC COAST LINE.—*Equipment-Trust Certificates.*—The Interstate Commerce Commission has authorized the issuance of \$5,085,000, 4½ per cent equipment-trust certificates, series E, maturing in equal annual amounts on February 1, 1927, to 1941, to be sold to J. P. Morgan & Co. at 97½. The equipment includes 45 locomotives, 73 passenger train cars and 1,400 freight cars, having a total approximate cost of \$6,374,865.

BEECH CREEK.—*Abandonment.*—This company, which is leased by the New York Central, has been authorized by the Interstate Commerce Commission to abandon its branch from Kerrmoor, Pa., to Gazzam, 298 miles, serving a coal operation since abandoned.

BUFFALO, ROCHESTER & PITTSBURGH.—*Tentative Valuation.*—The Interstate Commerce Commission has served a tentative valuation report as of 1917 placing the final value for rate-making purposes at \$48,827,821 for the property owned and \$57,529,352 for the property used. The outstanding capitalization as of valuation date was \$45,622,000 and the investment in road and equipment, including lands, was stated on the books as \$52,912,192, which the report readjusts to \$54,474,099. The cost of reproduction new was reported as \$53,714,454 for the property owned and \$63,038,369 for that used, while the cost of reproduction less depreciation was reported as \$48,827,821 for the property owned and \$57,529,352 for that used.

W. T. Noonan, president of the Buffalo, Rochester & Pittsburgh, has issued a statement saying that the company in answering the tentative valuation will hold that "the proper amount representing the value of its property and rights enjoyed by it will approximate \$100,000,000 as of June 30, 1917. His statement follows:

In regard to the tentative valuation placed by the Interstate Commerce Commission as of June 30, 1917, on the property of the Buffalo, Rochester & Pittsburgh and its leased lines, viz.: the Clearfield & Mahoning, the Allegheny & Western, the Allegheny Terminal Company and the Mahoning Valley. It will be of interest to those who have followed the progress of railroad valuations, to note that, in common with tentative valuation heretofore issued, prices as of June 30, 1914, have been applied to the property as it existed June 30, 1917, without regard to cost of property created between those dates and price levels as of date of valuation.

The tentative valuation for rate making purposes of \$57,529,352 is based on cost of reproduction new, less depreciation, as of June 30, 1917. The carrier's investment in road and equipment on that date amounted to \$60,505,000, and its outstanding stocks and bonds, including those of subsidiary companies, \$52,785,915.

Additions and betterments to the property made since June 30, 1917, amounting to about \$13,000,000, are not included.

Approximately 20 per cent has been deducted for depreciation as determined theoretically by the so-called straight line method, although the government engineers found the property normally maintained, and so reported to the Bureau of Valuation. Instead of the property being in a depreciated condition, it was actually in an appreciated condition, but no allowance has been made for appreciation.

Nothing has been allowed for cost of development.

Land values have been measured in part by the value of so-called similar and adjacent land, but apparently without adequate consideration being given to their adaptability for railroad use or the carrier's actual cost experience. Deductions have been made to represent so-called non-carrier use.

Nothing has been allowed to cover the cost of impounding reservoirs, four in number, located in Pennsylvania, which supply the major portion of water for transportation purposes in that state, and without which the carrier would at times be seriously affected.

The carrier's one-half joint ownership in the Ontario Car Ferry Co., Ltd., is not included in the valuation, although this property furnishes its principal outlet for freight and passengers to Canadian points.

Nothing has been included to cover the earning power of the carrier or its peculiar strategic position geographically.

An inadequate allowance has been made for coal support owned by the carrier in Pennsylvania, which has been acquired to insure the safety of its trains traversing coal territory, where there would otherwise be a considerable hazard if the coal were removed.

In answering the tentative valuation, the Railway Company will state that the proper amount representing the value of its property and rights enjoyed by it will approximate \$100,000,000 as of June 30, 1917.

CHESAPEAKE & OHIO.—Buys Leased Line.—The Chesapeake & Ohio has purchased the Island Creek, Nuttall, W. Va., to Lookout, 7.82 miles, which it has hitherto operated under a lease.

CHICAGO & EASTERN ILLINOIS.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$930,000 of 5 per cent equipment trust certificates to be sold to Kuhn, Loeb & Co., at 99.25.

CHICAGO, ROCK ISLAND & PACIFIC.—Preliminary Annual Report.—The Rock Island earned a surplus in 1925 equivalent to \$4.54 per share on the common stock after the payment of all fixed charges and dividends on the preferred stocks, according to a preliminary annual report mailed to stockholders on February 6. This surplus compares with a surplus of \$4.36 in 1924, and \$1.22 in 1923. According to the income account, a decrease of \$197,265.98 in total railway operating income was more than offset by a decrease of \$437,060.34 in total railway operating expenses. The statement addressed to the stockholders by Charles Hayden, chairman of the board, is quoted in part below:

"The passenger revenue continued to decrease, due almost entirely to the competition of the motor vehicle. We recognize that this competition has come to stay and we are making our best efforts to develop that phase of the passenger business with which the motor bus cannot compete, namely, the long haul traffic. In following this policy we have had great success with the Golden State Limited, our premier California train. It earned last year a very substantial amount over the direct cost of operation. . . .

"During the year we purchased a minority interest in the stock of the St. Louis Southwestern which we regarded as a desirable purchase at the price paid for it. While our ownership of this interest was still under consideration by the Interstate Commerce Commission, a favorable opportunity arose to sell our holdings and we disposed of them to the Kansas City Southern Railway Company at a net profit for our stockholders of approximately \$2,467,000. The Rock Island purchased the stock directly from its owners and sold it directly to the purchaser. There were no commissions or fees of any kind in connection with the transaction. This profit is not included in the above mentioned earnings for the year 1925 but is in addition thereto. . . .

"Notwithstanding the progress of voluntary consolidations under the present Transportation Act and the prospect of further legislation looking to permissive consolidations, your board of directors is not at this time planning any merger or consolidation of your property, but is bending every effort to its strengthening and upbuilding."

DELRAY CONNECTING.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes as of 1918 at \$1,278,000.

DONIPHAN, KENSSETT & SEARCY.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$39,770 as of 1917.

GULF & SHIP ISLAND.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes of the property owned and used for common-carrier purposes at \$9,034,850 as of 1916.

MASSILLON BELT.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$19,123 as of 1916.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—Abandonment.—The Interstate Commerce Commission has authorized the abandonment of a branch line from Western Junction, Wis., to Phlox, 10.98 miles. This branch was a part of the former Wisconsin & Northern and served a lumber operation which has since ceased operation.

MINNESOTA WESTERN.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,140,000 of 6 per cent gold bonds to be sold at not less than 90 for the purpose of completing construction of a line between Lake Lillian and Dawson, Minn.

MISSISSIPPI CENTRAL.—Tentative Valuation.—The Interstate Commerce Commission in a tentative valuation report as of 1918 has placed the final value for rate-making purposes at \$4,775,000 for the property owned and \$4,776,055 for that used.

MONSON.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$77,113 as of 1916.

MUNCIE BELT.—Final Value.—The Interstate Commerce Commission has placed the final value for rate-making purposes at \$62,654 as of 1915.

NEW PARK & FAWN GROVE.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$106,020 as of 1916.

PITTSBURGH & WEST VIRGINIA.—Equipment Trust.—This company has applied to the Interstate Commerce Commission for authority for an issue of \$2,000,000 of 4½ per cent equipment trust certificates, to be sold to Dillon, Read & Co. at 97.49.

SAVANNAH & ATLANTA.—Receivers' Certificate.—The Interstate Commerce Commission has authorized the issuance of an 8 per cent receivers' certificate for \$150,000, to retire a certificate of like amount which matured on December 29, 1925.

SEABOARD AIR LINE.—Bond Extension.—The Interstate Commerce Commission has authorized this company to extend the time of payment of \$1,000,000 Raleigh & Augusta Air Line first mortgage bonds to January 1, 1931, with interest at five per cent, and to enter into an agreement providing for the redemption of these bonds at the option of the carrier. Publication of the Seaboard Air Line's offer to extend the bonds was noted in the *Railway Age* of January 9.

SEWELL VALLEY.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$423,365 as of 1916.

SOUTHERN RAILWAY.—Bonds.—The Interstate Commerce Commission has authorized the issuance of \$1,774,000, five per cent first consolidated mortgage bonds, to be sold at not less than par and the proceeds to be used for the retirement of a like amount of Virginia Midland serial mortgage bonds.

STEWARTSTOWN.—Final Value.—The Interstate Commerce Commission has found the final value for rate-making purposes to be \$156,040 as of 1916.

TENNESSEE CENTRAL.—Securities.—This company has applied to the Interstate Commerce Commission for authority to issue 60,000 shares of no par value common stock to be exchanged for \$3,000,000 of common stock and \$500,000 of 7 per cent cumulative preferred stock to be sold at not less than 95 for additions and betterments; and to sell \$1,500,000 of first mortgage bonds now pledged with the Secretary of the Treasury as security for a government loan, to White Weld & Co., at 95 for the purpose of paying off the loan.

TEXAS MEXICAN.—Negotiations for Control by Southern Pacific Rumored.—Negotiations are said to be in progress between the National Railways of Mexico and the Southern Pacific for the taking over of control of the line by the latter. The Texas Mexican is a subsidiary of the National Railways of Mexico and has a line from Corpus Christi, Texas to Laredo. Laredo is the main rail gateway and connection with the Mexican lines.

UNION RAILROAD, PITTSBURGH.—Tentative Valuation.—The Interstate Commerce Commission has issued a tentative valuation report placing the final value for rate-making purposes as of 1917 at \$14,905,000 for the property owned and \$22,980,263 for the property used.

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly; preferred, 2 per cent, both payable April 1 to holders of record March 1.
North Pennsylvania.—\$1, quarterly, payable February 25 to holders of record February 15.
American Railway Express Company.—\$1.50, payable March 31, to stockholders of record March 15.

Average Price of Stocks and Bonds

	Feb. 16	Last Week	Last Year
Average price of 20 representative railway stocks	92.29	94.67	81.07
Average price of 20 representative railway bonds	95.12	95.14	90.05

Railway Officers

Executive

R. M. Bacheller, division freight and passenger agent of the Atchison, Topeka & Santa Fe, and vice-president of the St. Joseph Union Depot Company, with headquarters at St. Joseph, Mo., has been elected president of the Union Depot Company. **H. J. Plumbhof**, general superintendent of the Union Pacific, with headquarters at Kansas City, Mo., has been elected also vice-president of the St. Joseph Union Depot Company, succeeding Mr. Bacheller.

Operating

J. H. Beroth, acting assistant trainmaster on the Pennsylvania, with headquarters at Crown Point, Ind., has been promoted to assistant trainmaster, with the same headquarters.

J. H. Bowen has been appointed trainmaster of the Alabama division of the Seaboard Air Line, with headquarters at Americus, Ga. **Paul Hollis** has been appointed terminal trainmaster of the same division, with headquarters at Savannah, Ga.

Fred H. Shaffer, assistant general manager of the First district of the St. Louis-San Francisco, with headquarters at Springfield, Mo., has been promoted to general manager, with the same headquarters, succeeding **James H. Fraser**, who has resigned. Mr. Fraser has been in ill health for several months. The jurisdiction of **M. M. Sisson**, assistant general manager in charge of the Second district, has been extended to include the First district also.

Francis Boardman, who has been appointed assistant terminal manager of the New York Central and the New York, New Haven & Hartford, with headquarters at Grand Central Terminal, New York, was born on August 15, 1875, at Rutland, Vt. He was educated at Phillips Andover Academy and at Yale University, from which latter institution he was graduated in 1897 with the degree of B. A. In 1898 he served on construction work with the Detroit & Mackinac, and in 1899 he took a year's course in civil engineering at Columbia University. In 1899 and 1900 he was employed as transitman on railroad construction in West Virginia with the West Virginia Short Line. In the latter part of 1900 he entered the employ of the New York Central in the engineering department and held positions successively as assistant engineer, supervisor of track, designing engineer and division engineer. He then became manager of buildings, which position he held until the time of his recent appointment to assistant terminal manager of the Grand Central Terminal.

Traffic

W. R. Rhodes, traveling passenger agent of the Chesapeake & Ohio, with headquarters at Norfolk, Va., has been transferred to Staunton, Va., with the title of division passenger agent. **M. L. Murray**, traveling passenger agent, with headquarters at Charlottesville, Va., has been transferred to Norfolk, Va.

J. Hudson Day has been appointed assistant general freight agent of the Nickel Plate district and the Lake Erie & Western district of the New York, Chicago & St. Louis, succeeding **R. E. Norris**, deceased. **R. A. Williamson** has also been appointed assistant general freight agent, and **W. J. Courtney** has been appointed chief of the tariff bureau, succeeding Mr. Williamson.

C. F. McTague, who has been promoted to assistant freight traffic manager of the Delaware, Lackawanna & Western, with headquarters at New York, was born on July 2, 1875, at Galt, Ont. He entered railway service in 1892 in the local freight office of the Canadian Pacific at Galt, and on June 1, 1893, entered the service of the Michigan Central as rate clerk

with the division freight agent at Buffalo. He became chief clerk to the general eastern freight agent of the Delaware, Lackawanna & Western at New York on September 26, 1899, and, in 1903, became contracting freight agent. He was appointed commercial agent at Cleveland, O., on December 1, 1905, and general eastern freight agent at New York on July 1, 1909. He became assistant general freight agent at Buffalo on November 1, 1909, and general foreign freight agent at New York on July 1, 1924, which position he was holding at the time of his recent promotion.

Joseph J. Byrne, who has been promoted to freight traffic manager of the Delaware, Lackawanna & Western, with headquarters at New York, was born in 1871, at Riley, Ohio. He was educated in the public schools at Indianapolis, Ind., and entered railroad service in 1887. From that time he was consecutively until 1892 telegraph operator and traffic agent for the Cleveland, Chicago, Cincinnati & St. Louis. From 1892 to 1897 he was contracting agent for the Nickel Plate fast freight line, at Indianapolis, Ind., and from September, 1897 to 1900, was agent for the Lackawanna fast freight line at the same place. From 1900 to November, 1905, he was commercial agent of the Delaware, Lackawanna & Western, at Cleveland, Ohio, and from 1905 to November, 1909, division freight agent on the same road, at Syracuse, N. Y. He was general eastern freight agent at New York from November, 1909, to 1917, and from 1918 to February, 1919, was assistant general freight agent. He became general freight agent in February, 1919, and assistant freight traffic manager in March, 1920, which position he was holding at the time of his recent promotion to freight traffic manager.

Nathaniel Duke, who has been promoted to general freight traffic manager of the Delaware, Lackawanna & Western, with headquarters at New York, was born on May 29, 1863, at Prince Frederick, Calvert county, Md. He attended high school at Baltimore, Md., and entered railway service on July 27, 1881, with the Baltimore & Ohio, at Camden station, Baltimore, and until December 31, 1885, held various clerical positions. In January, 1886, he entered the service of the Chicago, Burlington & Quincy as a way bill clerk in the local office of the traffic department, and in August, 1887, became assistant chief rate clerk in the general freight office at Chicago, where he remained for two years. For a year he was chief clerk in the general office at St. Louis, and subsequently became chief contracting agent. This position he held until December 31, 1892, when he became assistant general agent for the Great Northern at Chicago, remaining in this position until November, 1894. He was agent for the Elgin, Joliet & Eastern at Joliet, Ill., for almost two years, and on July 1, 1896, entered the service of the Nickel Plate Fast Freight Line, where he remained until October, 1898. He then became commercial agent for the West Shore at New Haven, Conn., which position he held until January 1, 1902, when he became New England agent for the Lehigh Valley, with headquarters at Boston, Mass., and New Haven, Conn. From September 1, 1902, until April 1, 1903, he was general New England agent for the Delaware, Lackawanna & Western at Boston, and later became general eastern freight agent at New York, which position he held until August, 1909. He was general freight agent until November 1, 1911, and assistant freight traffic manager until January, 1918. Under the railroad administration he was official classification territory assistant to Conrad Spens, traffic director, food administration, with headquarters at New York, where he remained until July 1, 1918, when he returned to the Delaware, Lackawanna & Western as freight traffic manager. He retained this position during the balance of federal control, and continued in it after the roads were returned to their owners.

Mechanical

E. R. Hanna has been appointed master mechanic of the Central Kansas division of the Missouri Pacific, with headquarters at Osawatomie, Kan., succeeding **W. P. Kershner**, resigned.

L. E. Crevasse has been appointed master mechanic of the East Florida division of the Seaboard Air Line, with headquarters at West Palm Beach, Fla. **G. A. Haslett** has been appointed general road foreman of engines of the Central and

Southern districts, with headquarters at Tampa, Fla. **H. C. Quarles** has been appointed master mechanic of the West Florida division, with headquarters at St. Petersburg, Fla.

John McVey, superintendent of motive power and shops of the Consolidated Railroads of Cuba, with headquarters at Camagüey, Cuba, has resigned and will shortly return to the United States.

A. A. Raymond has been appointed superintendent of fuel and locomotive performance of the New York Central, with headquarters at Utica, N. Y. He was born on November 11, 1886, at Troy, N. Y., and was graduated from Cornell University in 1910, with the degree of M. E. He entered railroad service on July 15, 1910, with the New York Central as a special apprentice at the Avis shops, and on November 16, 1912, was appointed assistant engine house foreman. On January 17, 1917, he became service test engineer at New York, N. Y., and on July 16, 1920, he was appointed assistant master mechanic, with headquarters at Syracuse, N. Y. Mr. Raymond served in the same capacity at Buffalo, N. Y., from November 1, 1922, until June 16, 1924, when he became master mechanic at Watertown, N. Y., which position he held until his recent appointment as superintendent of fuel and locomotive performance.

Engineering, Maintenance of Way and Signaling

E. C. Gegenheimer, assistant general yardmaster of the Pennsylvania, with headquarters at Chicago, Ill., has been promoted to assistant engineer on the staff of the chief engineer maintenance of way of the Western region, with the same headquarters.

Eugene N. Philips, who has been appointed assistant valuation engineer of the Bessemer & Lake Erie, with headquarters at Pittsburgh, Pa., was born on December 11, 1883, at Pittsburgh, Pa. He attended Bethany College and the University of Pittsburgh, and entered railroad service in the spring of 1905 as assistant on the engineering corps of the Baltimore & Ohio. From 1907 to 1909 he was engaged in general contracting work in Florida and in municipal work in southeastern Ohio. Following this, he re-entered the employ of the Baltimore & Ohio in the capacity of transitman and assistant division engineer, serving consecutively at Baltimore, Md., Philadelphia, Pa., and Newark, Ohio. In 1913, Mr. Philips was appointed assistant engineer in the office of chief engineer, maintenance-of-way, on the Pennsylvania Lines, Lines West, at Pittsburgh, Pa., and from 1914 to 1924 he served as pilot engineer and supervising pilot engineer on the same lines valuation department. In 1924 he became assistant valuation engineer of the Union Railroad, which position he held until the time of his recent appointment also as assistant valuation engineer of the Bessemer & Lake Erie.

Purchases and Stores

J. W. Moriaety has been appointed storekeeper of the Charlotte Harbor & Northern, with headquarters at Arcadia, Fla.

J. H. Davis, storekeeper on the Minneapolis & St. Louis, with headquarters at Marshalltown, Ia., has been appointed purchasing agent of the Minneapolis, Northfield & Southern, with headquarters at Minneapolis, Minn.

E. C. Hoffman, assistant purchasing agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., has been promoted to purchasing agent, with the same headquarters, and the position of assistant purchasing agent has been abolished.

George P. Maclaren, maintenance of way engineer of the Central region of the Canadian National, has been appointed general tie and timber agent, with headquarters at Montreal, succeeding **W. H. Grant**, who has been granted a leave of absence pending retirement after many years of service with the company.

T. A. Hodges has been appointed assistant general storekeeper of the Seaboard Air Line and has been temporarily assigned to special duties in connection with building of new

lines in Florida. **T. A. Rousseau** has been appointed storekeeper at Howells, Ga., succeeding **Mr. Hodges**. **A. Hensler** has been appointed assistant storekeeper at Jacksonville, Fla., succeeding **Mr. Rousseau**.

Special

Angus Gordon, manager of the Chateau Laurier, at Ottawa, Ont. (one of the hotels operated by the Canadian National), has been granted a leave of absence, owing to ill-health. **Joseph Vanwyck**, manager of the Macdonald Hotel in Edmonton, Alberta, will manage the Chateau Laurier during **Mr. Gordon's** absence, and **W. S. Detlor**, manager of the Manoir Richelieu and Tadousac Hotels of the Canada Steamship Company, will relieve **Mr. Vanwyck**.

Obituary

G. V. Cummings, trainmaster on the Pennsylvania, with headquarters at Akron, O., died in Cleveland, O., on February 8.

Thomas L. Lipsett, division passenger agent of the Pennsylvania, at Washington, D. C., died suddenly at Washington, on February 12.

C. F. Hayes, general agent, traffic department, of the Minneapolis & St. Louis, with headquarters at Indianapolis, Ind., died in that city on February 9.

D. E. Brown, formerly general agent in the Orient of the Canadian Pacific, who retired from active service in 1908, died at Vancouver, B. C., on February 10, at the age of 71.

Stanley H. Johnson, vice-president and freight traffic manager of the Chicago, Rock Island & Pacific, with headquarters at Chicago, died at his home in that city on February 15, after



Stanley H. Johnson

a week's illness with bronchial pneumonia. He was born on February 2, 1872, at Bunker Hill, Ill., and entered railway service as a stenographer for the Southern Interstate Association at St. Louis. He was later employed as a stenographer in the freight traffic department of the Missouri Pacific and subsequently worked in a similar capacity on the Chesapeake & Ohio. From 1894 to 1902 **Mr. Johnson** held various traffic positions, including that of secretary of the Southwestern Freight Bureau at St. Louis.

He entered the service of the Rock Island in June, 1902, as chief clerk to the third vice-president and freight traffic manager at Chicago and was promoted to assistant general freight agent at Little Rock, Ark., in 1904. He was transferred to Chicago in 1906 and was promoted to assistant freight traffic manager, with the same headquarters, in February, 1909. **Mr. Johnson** was promoted to freight traffic manager in December, 1915, and on March 1, 1920, was elected vice-president and freight traffic manager. He continued in that position until his death.

H. J. Griffing, terminal agent of the Mobile & Ohio, with headquarters at Mobile, Ala., died in that city on February 3. **Mr. Griffing** was president of the Freight Station section of the American Railway Association in 1913-14.

W. J. F. Craig, superintendent of forestry and fire protection of the Western region of the Canadian National, with headquarters at Winnipeg, Man., died suddenly of heart disease on a train en route to Winnipeg on February 12.